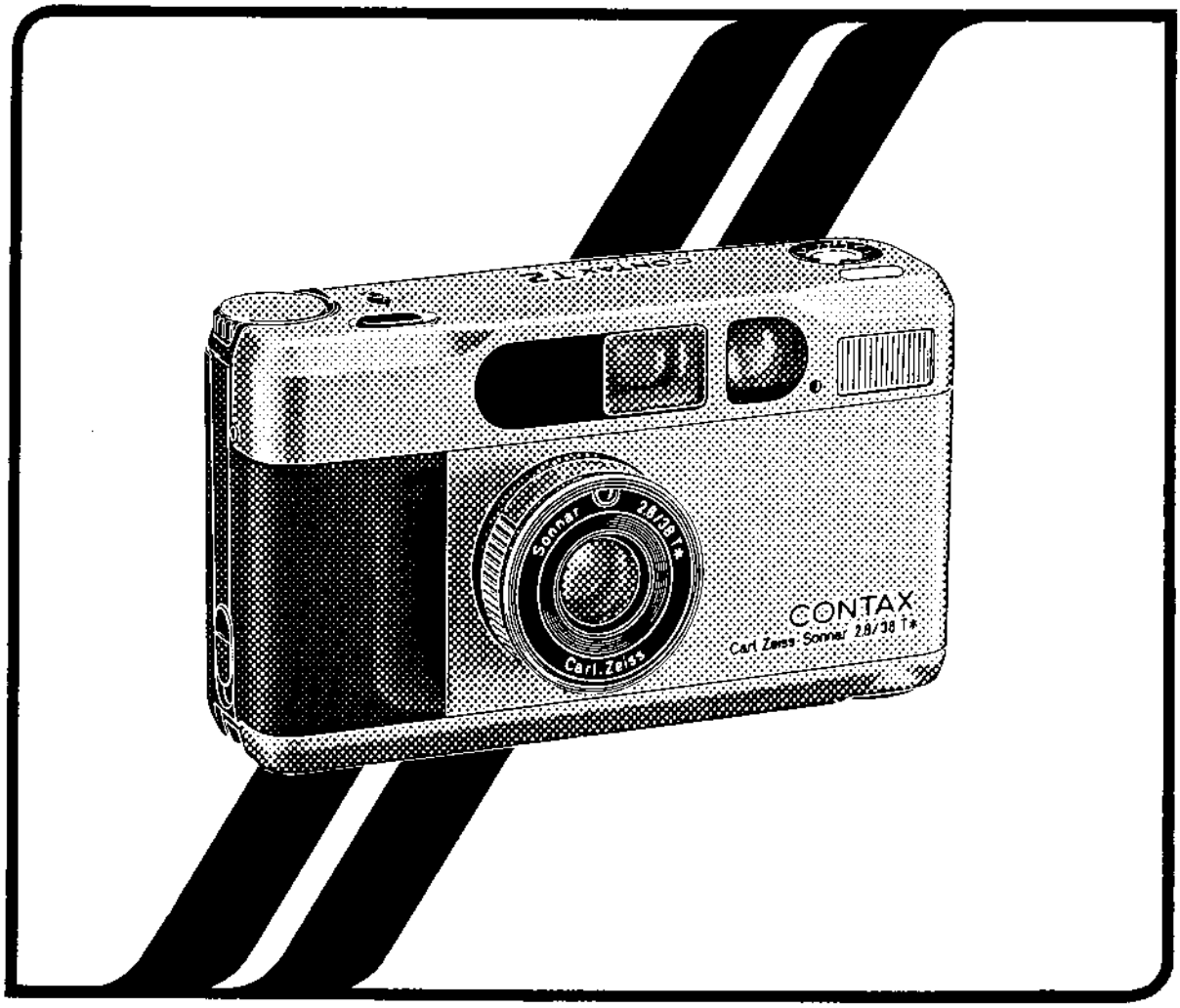
KYOCERA




# CONTAX T2

## Repair Manual

CONTENTS

A MECHANISM AND ELECTRICAL CIRCUITS

Specification of CONTAX T2 ---------- A- 1

Internal Structure ---------- A- 4

Principal Mechanisms ---------- A- 4

Circuit Block Diagram ---------- A- 8

Outline of Electronic Circuit ---------- A- 9

Description of Timing Chart ---------- A-13

IC Function and Description of Terminals ---------- A-16

CPU Functions ---------- A-26

Functions of Switches ---------- A-28

Description of Electrical Circuits ---------- A-30

Circuit Diagrams ---------- A-43,A-44

B DISASSEMBLY PROCEDURE

Disassembly of Exterior Parts ---------- B- 1

Disassembly of Main FPC Ass'y ---------- B- 6

Disassembly of Sub FPC Ass'y ---------- B-12

Disassembly of F-D Base Ass'y ---------- B-13

Disassembly of Flash Unit ---------- B-14

Disassembly of Viewfinder Unit Ass'y ---------- B-14

Disassembly of AF Front Plate Ass'y ---------- B-15

Disassembly of Winding Mechanism ---------- B-15

Disassembly of Lens Barrel Ass'y ---------- B-18

Disassembly of DX Case Ass'y ---------- B-19

Disassembly of PI-WI Ass'y ---------- B-19

Disassembly of Lock Plate Cover Ass'y ---------- B-20

C REASSEMBLY AND ADJUSTMENT PROCEDURE

C-1 Reassemby of Assembly Parts

Reassembly of AF Front Plate Ass'y ---------- C- 1

Reassembly of Lens Barrel Ass'y ---------- C- 3
Reassembly of Lock Plate Cover ---------- C-12
Reassembly of F-D Base Ass'y ---------- C-13
Reassembly of Exp.Compensation Dial Ass'y ---------- C-14
MM Base Plate (Lower) Ass'y ---------- C-14
Affixing AF Window Moquette to Viewfinder Ass'y ---------- C-16
Affixing AF Window Moquette to Top Cover Ass'y ---------- C-16
Affixing Insulator (Back) ---------- C-17

C-2 Reassembly and Fofming of Parts in Cmera Body

Installation of Capacitors and Coil ---------- C-18
Sticking Cam FPC Foming Tape ---------- C-19
Installation of AL Roller Holder ---------- C-19
Forming of Lead Wires on Sub FPC ---------- C-20
Forming of Lead Wires of Flash Unit ---------- C-21
Installation of Self-timer LED ---------- C-22
Installation of Release Plate Spring ---------- C-22
Notes on Installation of Aperture Ass'y ---------- C-23
Notes on Positioning of Black Lead Wire of Capacitor ---------- C-23
Installation of Lens Cell Name Plate and Exp. Compensation Dial Name Plate ---------- C-24

C-3 Modified Parts

Modification of Cartridge Holder ---------- C-25
Modification of Explanation Seal ---------- C-25
Modification of MM Base Plate (Upper) and MM Base Plate (Lower)----- C-26
Modification of FPCs ---------- C-30
Forming Lead Wires New FPC ---------- C-35

C-4 Adjustments and Others

Viewfinder LED Position Adjustment ---------- C-37
Reference Voltage Adjustment ---------- C-38

Adjustments of Compensation Values ---------- C-39

Backup Data Memory Structure ---------- C-51

C-5 Others

Program AE Charts ---------- C-54

Current Consumption ---------- C-54

Description of Test Points ---------- C-55

Function of Electrical Parts ---------- C-65

Wiring Diagrams ---------- C-74,C-75

# Specification of CONTAX T2

## LENS

| | |
|---|---|
| Name | Carl Zeiss T* Sonnar |
| Construction | 5 elements in 4 groups |
| Focal length | :f 38mm |
| Aperture range | :F 2.8～F 16 |
| Minimum focal lenght | :0.7m |
| Exposure renge/magnification (at 0.7m): | 396.4X596.4mm 1/16.42 times |
| Angle of view | 60°(∞ diagonal) |
| Filter diameter | Filter not installable |
| Focusing system | Motor-driver all-group advanse system |
| Aperture blades | 7 blades |
| Shutter blades | 3 blades |
| Total lenght | 41.93mm (film surface to lens end at infinity) |

## VIEWFINDER

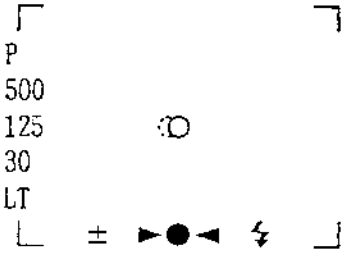
| | |
|---|---|
| Type | Inverted Galilean Bright frame,illuminated window |
| Magnification/field of view | 0.6X, 85% (at infinity) |

Viewfinder indication

Focus :►●◄

Flash charge : ϟ (blinks during charge,and lights up at charge completion)

Exposure compensation : ±



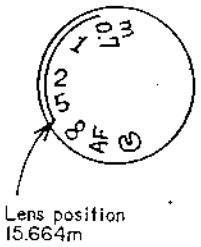

Program : P (lit only during program control)

Shutter speed : 500(500 blinks for overexposure
125
30 (LT lights up for 1 to 1/30sec)
LT (LT blinks for auto bulb)

Self timer : ● (● mark in center of focus indicatio)

## FOCUS CONTROL

| | |
|---|---|
| Control system | Infrared active AF-MF switching system |
| Control steps | 118 steps (hominal) Distance: 0.698m 7.8710m<br>Set to 15.698m when distance can not be metered (IR LED does not reflect) |
| AF operation | Half-press relese button (AF lock by continuous half-press) |
| MF operation | By focus dial |
| Focusing indication | Focus indication in viewfinder<br>Auto focus mode :<br>Distance metering complete: ● (green) mark lighting up<br>Too close distance : ► (red) mark blinking<br>(0.7~0.4m) (no release lock)<br><br>Manualfocus mode:<br>(Indication in viewfinder is made according to focus dial setting and distance metering result)<br>Near focus : ◄ (red) mark lighting up<br>In focus : ● (green) mark lighting up<br>Far focus : ► (red) mark lighting up |



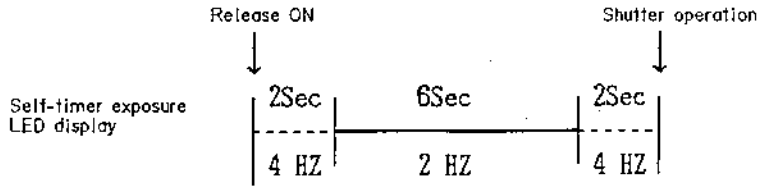
Lens position
15.664m

## EXPOSURE CONTROL

| | |
|---|---|
| Exposure control system | Aperture-priority program AE<br>Aperture-priority AE control when set to F4 to F16<br>Upper lightmetering limits of each aperture:<br>*F2.8 : EV10.6 1/200sec<br>F4 : EV11.5 1/180sec<br>F5.6 : EV12.3 1/160sec<br>F8 : EV13.1 1/140sec<br>F11 : EV13.8 1/120sec<br>F16 : EV14.6 1/100sec<br>*when F2.8 is set Aperture-priority AE control up to 1/200sec (EV10.6)<br>Program control abuve 1/200sec (EV10.6) |
| Metering system | External light metering system |
| Photodiode | SPD cell |
| Photodiode position | Top eye (in upper part of taking lens) |
| Metering range | 3EV~17EV (ISO100) |
| Film speed coupling renge | ISO25~5000(1/3step)<br>Auto setting by DX terminal |
| Exposure compensation | ± 2EV (in 0.5EV increments) |

## SHUTTER

| | |
|---|---|
| Type | Aperture-priority program AE electronic shutter |
| Shutter blade material | Plastic |
| Release system | Electronic release |
| Shutter speed | 1sec ~1/500sec in progrem mode. Bulb shutter is released below 1sec.<br>1sec ~ sec in aperture-priority mode *See section on exposure control for upper limit (See Page C-54) |
| Release lock | By OFF of main switch |
| Self timer | For start turn self-timer switch ON and then press release button<br>Electronic 10sec delay,cancellable halfway:<br>self-timer switch OFF<br>main switch OFF<br>*self-timer restarts with release ON during self-timer operation<br>Indication: External LED blinking and "●"mark in viewfinder blinking |




## FLASH

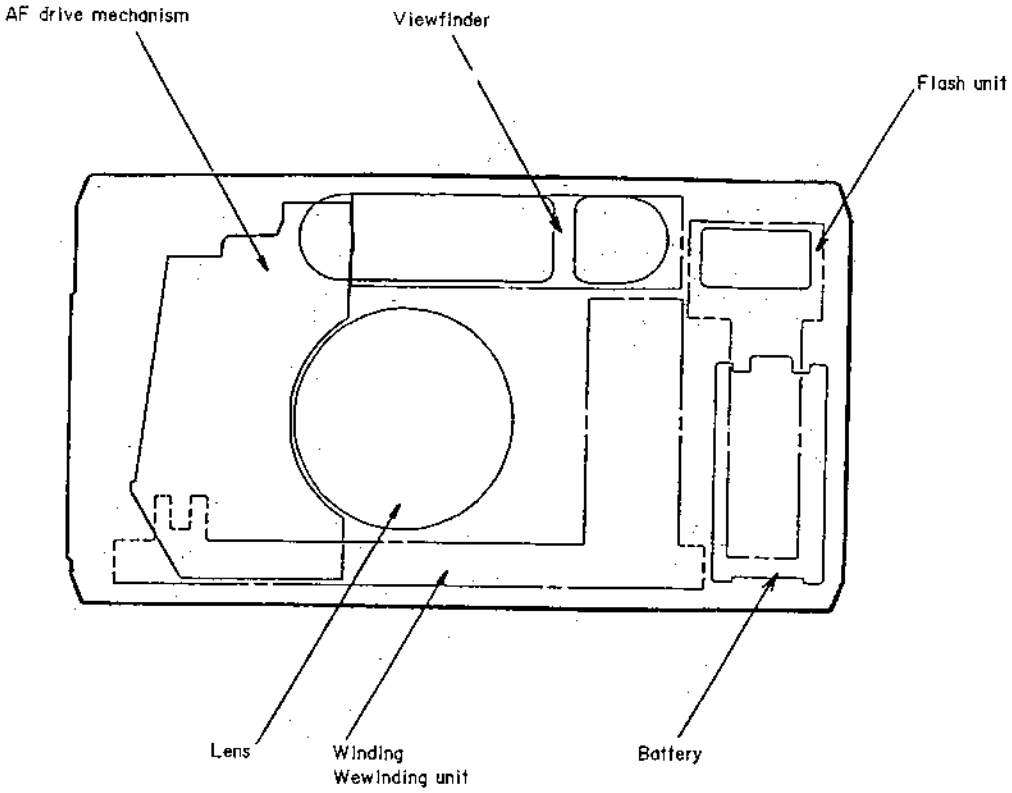
| | |
|---|---|
| Type | Built-in flashmatic control(pre-flash function in corporated to minimize red-eye effect) |
| Flash distance | 0.7m~3m(ISO100) |
| Charge time | Approx 3.5sec(with new battery) |

## BODY FUNCTIONS

| | |
|---|---|
| Film loading | Auto loading(winding to first frame with Back cover closed) |
| Film winding | Auto winding by built-in motor. In single mode only |
| Film rewinding | Auto rewinding by a built-in motor. Auto return. auto stop; riwind prior to roll completion possible |
| Rewind time | Approx 20 sec for 24 exposure film |
| Film counter | External LCD display; Automatic resetting,additive type count-down display at rewind |
| Power requirement | One 3V lithium battery(CR123A or DL123A) |
| Battery check | Auto check battery mark indication by external LCD<br>Warning: battery mark lighting 2.45V<br>Operation stop: all LCD display going out 2.40V or below<br>Number of possible exposures: about 25 rolls of 24-exposure film with flash used 50% of te time (normal temperature new battery) |

## INTERNAL STRUCTURE

The internal structure of CONTAX T2 roughly compreses the body,lens barrel unit,winding and rewinding unit,viewfinder unit,flash unit and circuit block unit.
These units are compactly arranged in such a way that the performance is assured with each of the functions operating most efficiently.



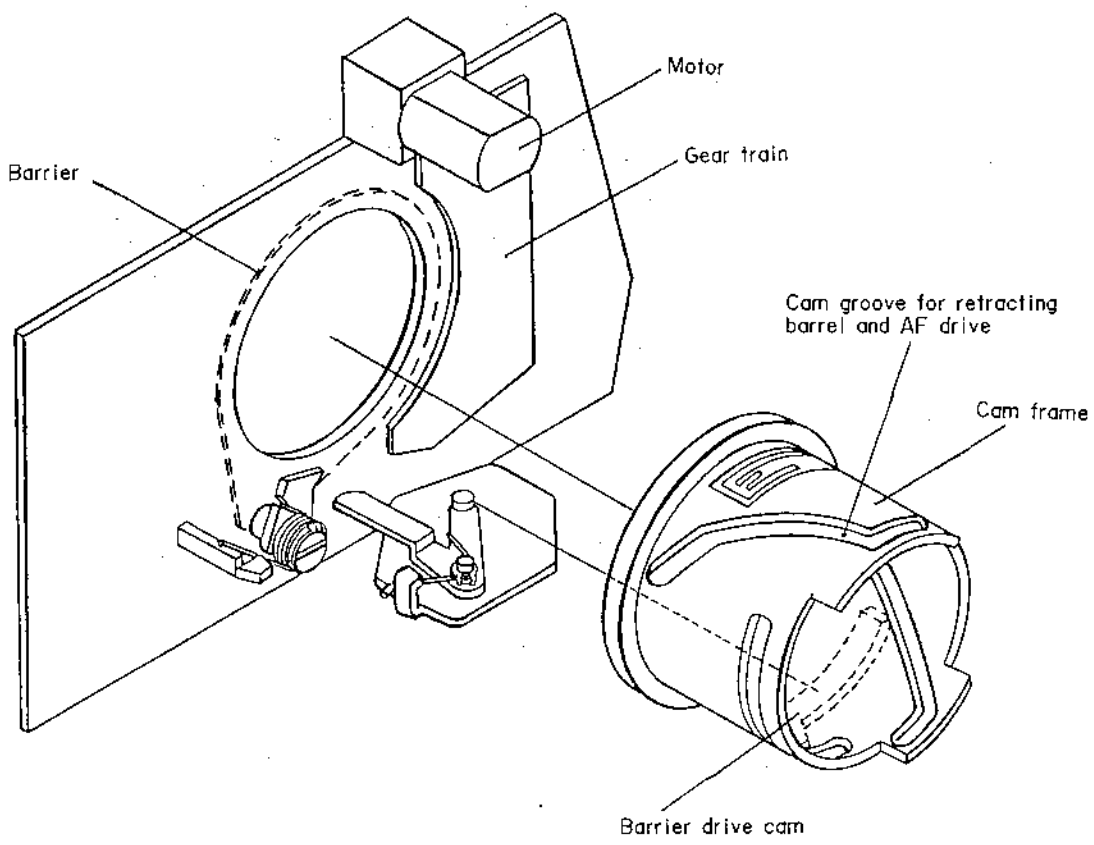

[Unit Layout]

## PRINCIPAL MECHANISMS

### 1.Lens Barrel

The lens barrel mechanism consists basically of ① lens unit, ② barrier mechanism, ③control motor mechanism and ④position detecting switch.
The lens unit is made up of a 3-blade behind electronic shutter in back and a diaphragm ring for the setting of aperture stop down value, flash and pre-flash in the front of the lens barrel.
This lens unit moves storaight back and forth inside the fixed frame in linkage with the rotaition of the cam frame for ordinary zoom lens. The opening and closing of the barrier is also controlled by this cam frame.
The drive system, with a motor including a photointerrupter and enconder positioned in the upper part of the body,drives the cam frame via the reduction gear train in the front of the body.

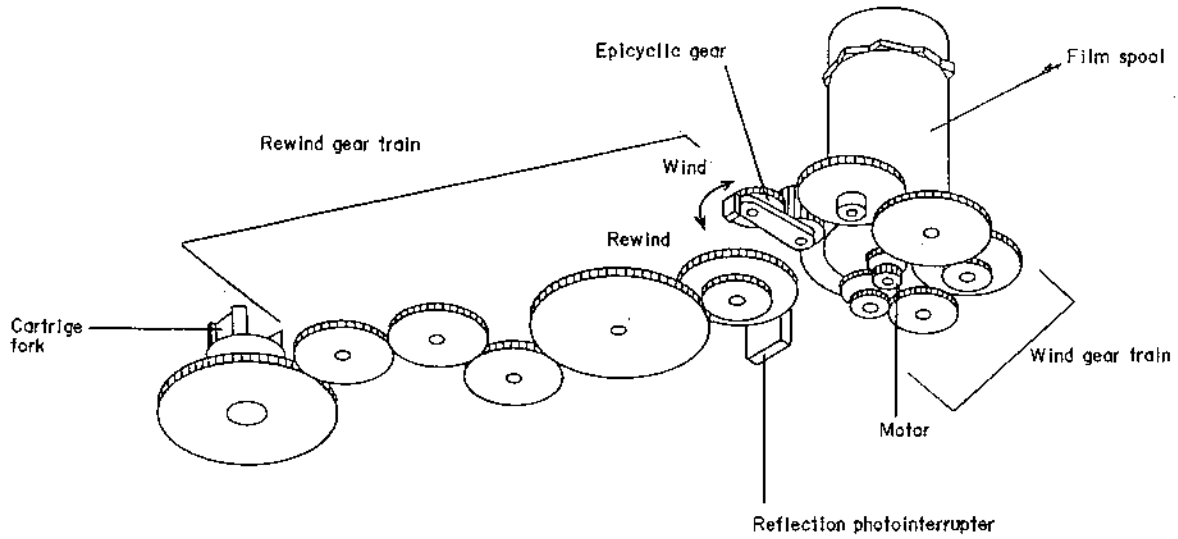
With the rotation of the motor, gear train and cam fram, the barrier opens and the lens, defected by the position defecting switch, is advanced to a proper position. For Focusing,the lens is advaced by the same drive system as the retracting barrel by the pulse count computed by CPU according to the autofocus function or manually set value.




[Barrier Operation Mechanism]

2.Film Transport Mechanism

The Film transport mechanism performs winding and rewinding by means of the Film spool and the cartridge fork,respectively,with the epicyclic gear switching its position according to the forward or reverse run of a sequence motor.
For control of the ordinary automatic winding mechanism,the movement of the sprocket linked with the peoforation is defected by an opposed type photointerrupter. with this camera model,nowever,the movement of the perforation is detected by a reflection-type photointerrupter,which sends infrared radiation directly to the film.

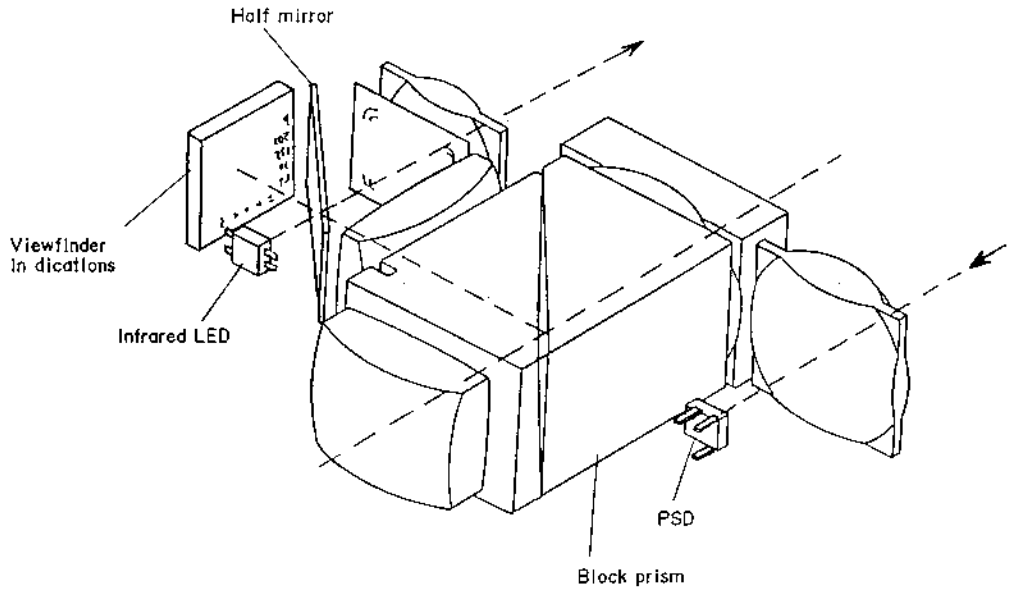


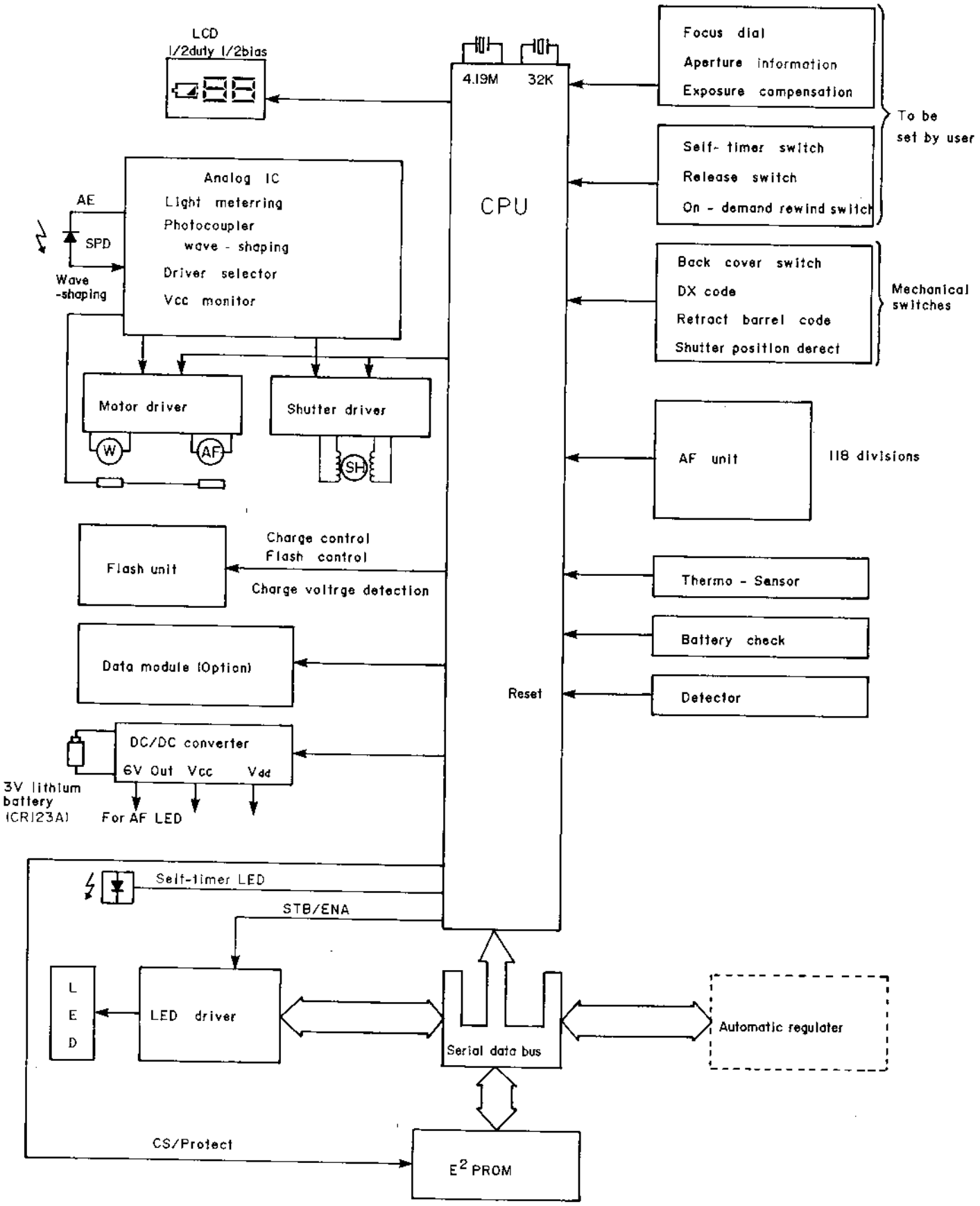

[Film Transport Mechanism]

3.Viewfinder Unit

The viewfinder employs a block prism of high-reflective-index optical glass as with CONTAX-T. This compact and uncommonly clear viewfinder therefore features a field of view of 85% and a magnification of 0.6 X.
The viewfinder indication includes the picture area frame,focus frame,program AE indication,shutter speeds,exposure compensation indication,focus indicator and flash mark. The picture frame to show the image area and the focus frame to show the distance metering object are both illuminated bright frames.
The picture area frame marks both the ordinary picture frame area and the Close -up picture area.
The program AE and shutter speeds are indicated on the left side. The "P" mark light up when AE at full aperture (F2.8) switches to program mode. Shutter speeds are indicated in 8 grades including bulb shooting and overexposure; that is "500", "125","30",or "LT" light or blinks to indicate the 4 grades.
Present at the bottom are the exposure compensation indication,focus indicator and flash mark. The lighting of the exposure compensation mark means that exposure is being compensated with the exposure compensation dial at other than "0".
The focus indicator consists of an in-focus mark,a near-focus mark and a far-focus mark.
In mannual focusing mode,set the focus dial so that the in-focus mark light up.
The flash mark indicates when the diaphragm ring is set to flash mode or pre-flash mode.

The blinking of this mark indicaters the process of the flash being charged, and the lighting the completion of charging.
Distance metering is performed by an infrared active triangular meterring system. An infrared ray emitting system and illuminated bright frames are combined to produce a simple, easy-to-see viewfinder with fewer windows.






Circuit Block Diagram

## OUTLINE OF ELECTRONIC CIRCUIT

As shown in the circuit block diagram, the electronic circuit of CONTAX-T2 consists of various dials and operation switches to be set by user and a 4-bit microcomputer to calculate data from switch sensors of the mechanism and function as a sequencer. The microcomputer also controls light metering, distanse metering and drivers. And light meterring and motor driver operation are performed by a custom analog IC.
The system clock of the CPU is based on the 4MHz clock pulse of a micro-miniatur ceramic oscillator.
The power source is a 3V lithium battery (123A type), and a stabilized power is supplies to the peripheral IC's from a DC/DC converter controlled by the CPU.
All the dial setting are input as data, with the analog values subjected to 8-bit A/D conversion by CPU.

## SYSTEM OUTLINE

The IC's used in the camera control circuit are as follows:

① CPU (IC101): System control
* The CPU is a one-chip microcomputer of 4-bit, 8064-byte ROM and 512-word (4-bit) RAM.It has also a 6-channel 8-bit A/D converter, LCD driver and serial interface built in it.

② AEIC(IC207): Light metering,motor selection, voltage check output, constant-voltage control, pulse shaping.

③ AFIC(IC301): Distance metering

④ EEPROM(IC103): Back up of adjusted values and status data
* EEPROM is a nonvolatile electrically erasable read-only memory of 16-bit 64-word structure.

⑤ Shift register (IC102): Viewfinder LED (P,500,125,30,LT, ± , ▶ , ● , ◀ ) indications

⑥ Booster IC(IC201): 6V voltage boosting

⑦ Moter drive IC(IC205): Shutter motor drive

⑧ Moter drive IC(IC206): AF and widing moter drive

⑨ Constant voltage IC(IC203): 5V constant voltage

⑩ Constant voltage IC(IC202): 3V constant voltage (for AF IC) *New FPC---IC302

⑪ Reset IC(IC204): 2.4V voltage check

1 Power supply

The battery to be used is a 3V lithium battery.Normally, with the booster switch of the CPU turned on,the circuit system operates mainly on the constant voltage output of 5V,using the 6V boosted by the booster IC(IC201).Also,the AF IC partially operates on 3V.

With power off,the booster switch turns off,and at this time the CPU operates the defection of LCD display control power ON start input on 3V. At power ON start.the booster switch turns on and the system operates on 5V. Also,the supply voltage,boosted and stabilized,is being monitored by the reset IC. When this voltage goes above 2.5V,the CPU will be reset automatically.

## 2 System operation

The CPU performs the input check and system control of the whole camera.
Light metering is done with the CPU sending a sampling signal and reading the data A-D converted by dual slope integration at the light metering analog IC.
Distance metering is accomplished with the CPU sending a start signal to the AF IC and reading the data returned.
The CPU receives the DX code(ISO data) as 5-bit degital data and the input of each switch at its status directly.
Exposure compensation setting, aperture setting and focus dial setting data are taken in by the CPU, which subjects the resistance-divided voltages to A-D conversion.
From these data,the CPU carries out indication control,shutter control and AF drive control by performing light metering calculations.
The viewfinder indication LEDs are directly turned ON or OFF by the CPU ports. In addition to it,the display is driver by use of a shift register,which transmits 8-bit indication data in synchronism with serial clock. The viewfinder LEDs,which are adjusted according to their brightness,are quite easy to see.
The LCDs are driven in 2-time-division mode by the LCD drivers built in the CPU.

## 3 Light metering

In light metering,the light currert signal of the SPD in the top eye position is logarithmically compressed and sent in real time to the CPU.
Exposure control can be mode either by aperture-priority AE combining manual exposure and electronic shutter or by unique aperture-priority program AE.
There are functions of ordinary aperture-priority AE. Besides these,when,for instance, the subject is bright, even at f2.8,showd the available brightness on the subject be out of the range set,the exposure control mechanism automatically switches to the program AE mode,and "P", which is the mark to indicate program mode,lights up. DX,whitch is for ISO25 to 5000,is automatically set in 1/3 steps. Exposure compensation can be set in 1/2EV increments in the range of -2 to +2EV.

## 4 Auto Focus

Auto Focus is done by active triangular metering with infrared emission.
The infrared beam emilted from an infrared LED goes straight and hits the subject,and the infrared rays reflected are gathered on to the receiving surfase of the PSD (Position Sensitive Device).The PSD outputs the light current corresponding to the receiving position of the gathered spot light.
Then this distance metering data is subjected to analog integretion and digital conversion by the AF IC before it is sent as pulse to the CPU.

The accuracy of Auto Focus is assured by 16 times of emission by the infrared LED. The Auto Focus data is then substituted in the linear equation obtained in the test mode to calculate the pulse count for the AF lens (lens barrel) advance.
In general,compact camera AF system make ajustments in 3 to 16 steps,but this camera employs a 118-steps AF mechanism for 0.7m to ∞ vange that is practically stepless.
Manual focusing makes use of the AF distance metering mechanism and the advance control mechanism as focusing aids. The operation is done by the turning of the focus dial (marked with ⓖ,AF,∞ and 5,2,1,0.7m) that functions also as the main switch. That is this dial as a rotary encoder conveys the distance information to the advance control mechanism, and the lens advances or withdraws upon receipt of the distance information just as in the case of auto focusing.
During the turning of the dial,the infrared emitter keeps on emitting pulses as a focusing aid. With the stop of turning, the pulse emission chauges to the emission of every 1/2 second and turns off 8 seconds later. (This is resumed at a half press of the shutter button).
"Near focus" or "far focus" is determinrd by the receiver of the PSD, and this information (i.e. the turning direction of the dial) is indicated by the focus mark in the viewfinder.
The Auto Focus data are recived in the range of distance indication of the dial, and the distance for the subject farther than that is indicated by the "in-focus" make in the viewfinder.

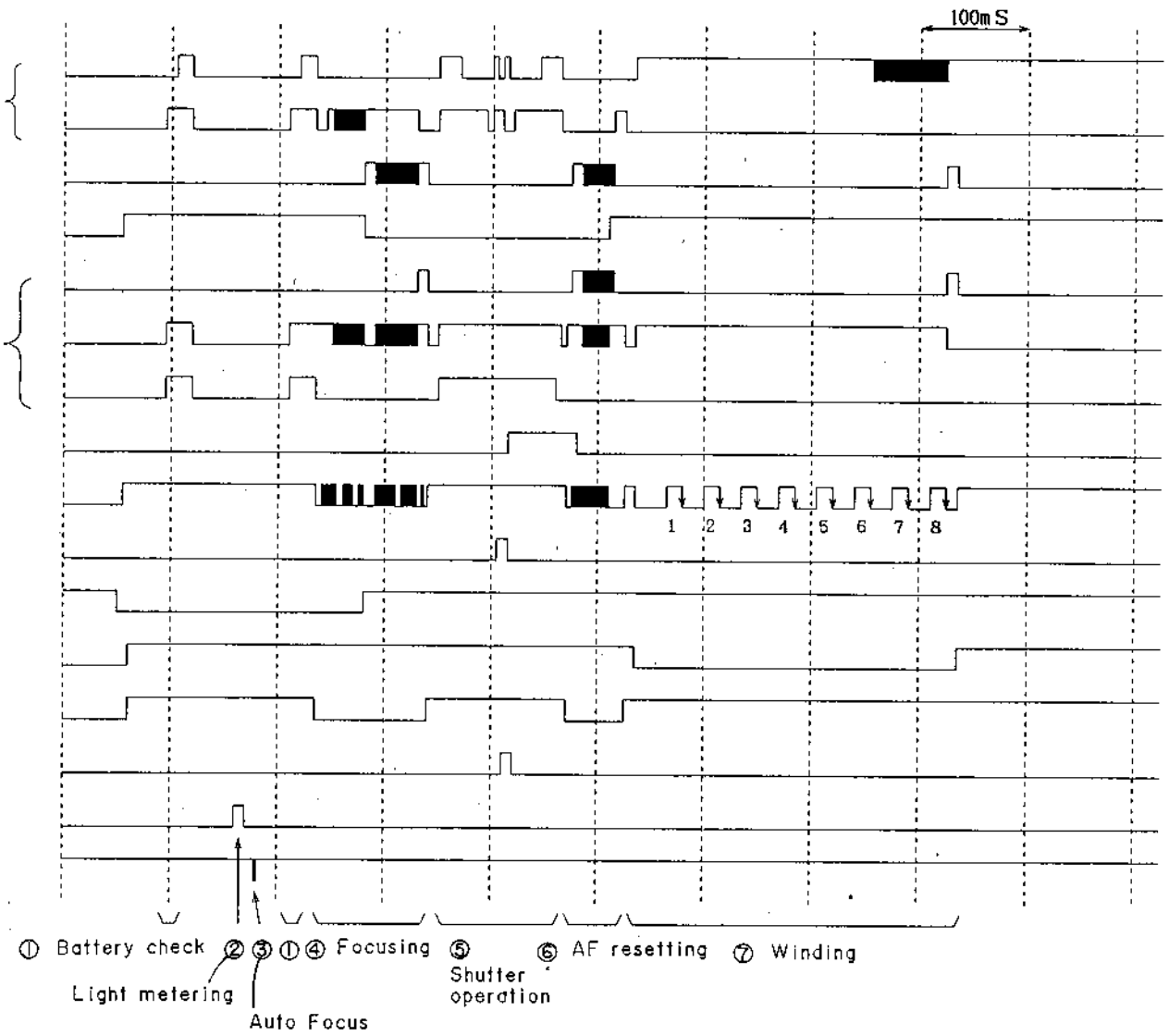
## 5 Flash

The flash unit comprises a flash emission, main capacitor, booster circuit and voltage defection controller. This miniatueized unit displays the flash power of G No.8 .
It performs flashmatic control,connected to the CPU via charge control signal, flash control signal and charge voltage completion difecting line.
When the Aperture Ring is set at the flash mark " ↯ " to give a normal Flas Mode. Setting the Aperture Ring at the dual-flash mark " ↯↯ " gives a pre-flash to reduces the chance of "red-eye" occurring.

## 6 Shutter

The Shutter is an electronic shutter of three blades that are opened and closed by stepping motor of 2-phase excitation.
Power to the stepping motor is supplied after a voltage regulation by the AE IC. The shutter is controlled by the AE IC as a selector and CPU as a controller.
The shutter speed is 1/500 to 1 sec in program mode.
The bulb mode is set automatically for a shutter speed of 1 sec on more.
The bulb shooting time is indicated in seconds on the LCD panel.

# Timing Chart



DESCRIPTION OF TIMING CHART

This timing chart represents the case where the check release switch is pressed fully.

1. At power ON with the turned ON, the power is supplied to the circuit. And after the seting of the I/O port, the backup data of EEPROM are read in preparation for film counter indication and status return (status immediately before power OFF stored).

2. Battery check ① by shutter load and status return (nothing occurring when normal) are performed. Then the DX code is read, and the aperture setting and exposure compensation setting are read in preparation for control calculations. At this point, a flash charge check is made if the aperture setting is of flash mode.

3. Key input checks are mode to see change in back cover, rewinding and main switch (OFF←→AF). without any change, light metering ②, distance metering ③ and contorol calculations are performed.

4. Key input check is mode again for release ON. Therefore, battery check ① is mode before the start of shutter (release) action.

5. The lens driven to the AF in-focus position or MF set position. Before stopped by the reversing brake ④, it is driver , for the pulse count of PI-P from CODEZ ON (L).

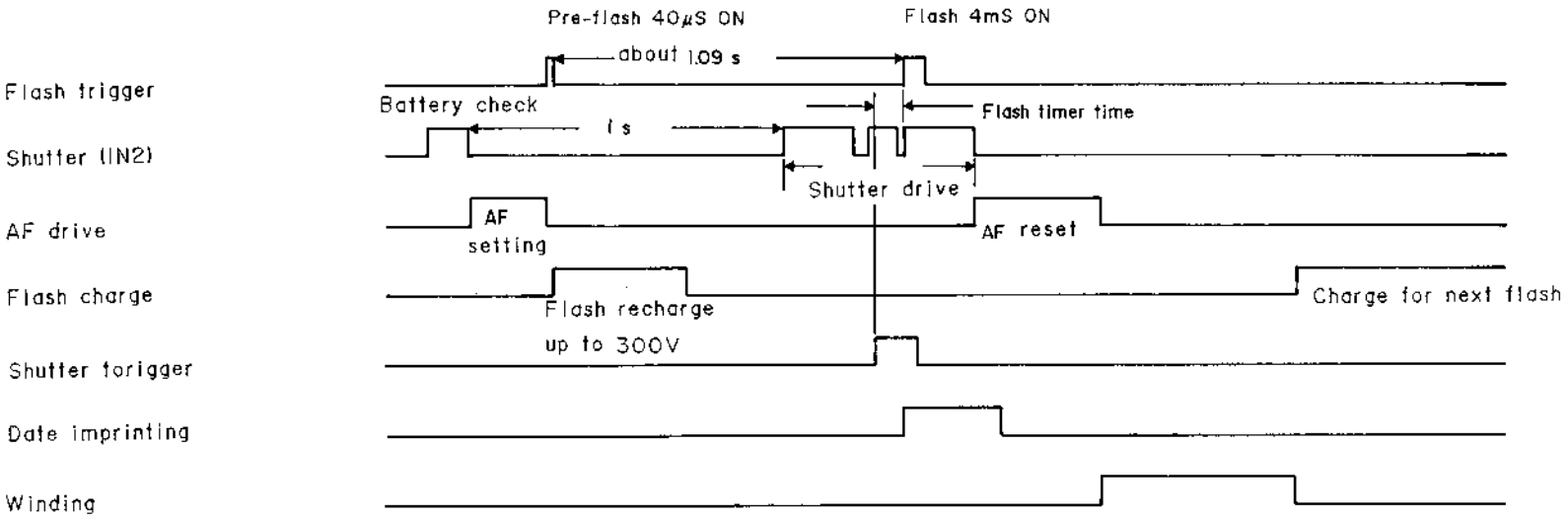
6. The shutter is opened and closed. The shutter control time is from shutter timing switch (SH-SW) ON (H) to the start of reverse drive by MD1 and 2. And the time for flash timing is from SH-SW ON to flash trigger signal (G.CONT) ON(H, 4mS).
   After a short pulse signal (see shutter control cicurit) for shutter close, the data imprint signal is turned ON (H). In the chart, it is ON for about 80m sec for ISO100. This time varies with the DX Code (ISO value), it keeps ON all during the next AF return drive ⑤.

7. The AF (lens) is returned to the ON position. Drive continues till code 2 SW OFF, where it is stopped by the reversing brake ⑥.

8. Winding takes place after detection of date imprint signal OFF (L). 8 perforation pulses (PI-P) correspond to one frame. Duty drive starts at the detection of 6 pulses, which is stopped by the revesing brake at the detection of 8 pulses. At this point, the film count is incresed by one. And when 8 pulses can not be counted in 2 second in this winding, it will be replaced by rewinding operation ⑦.

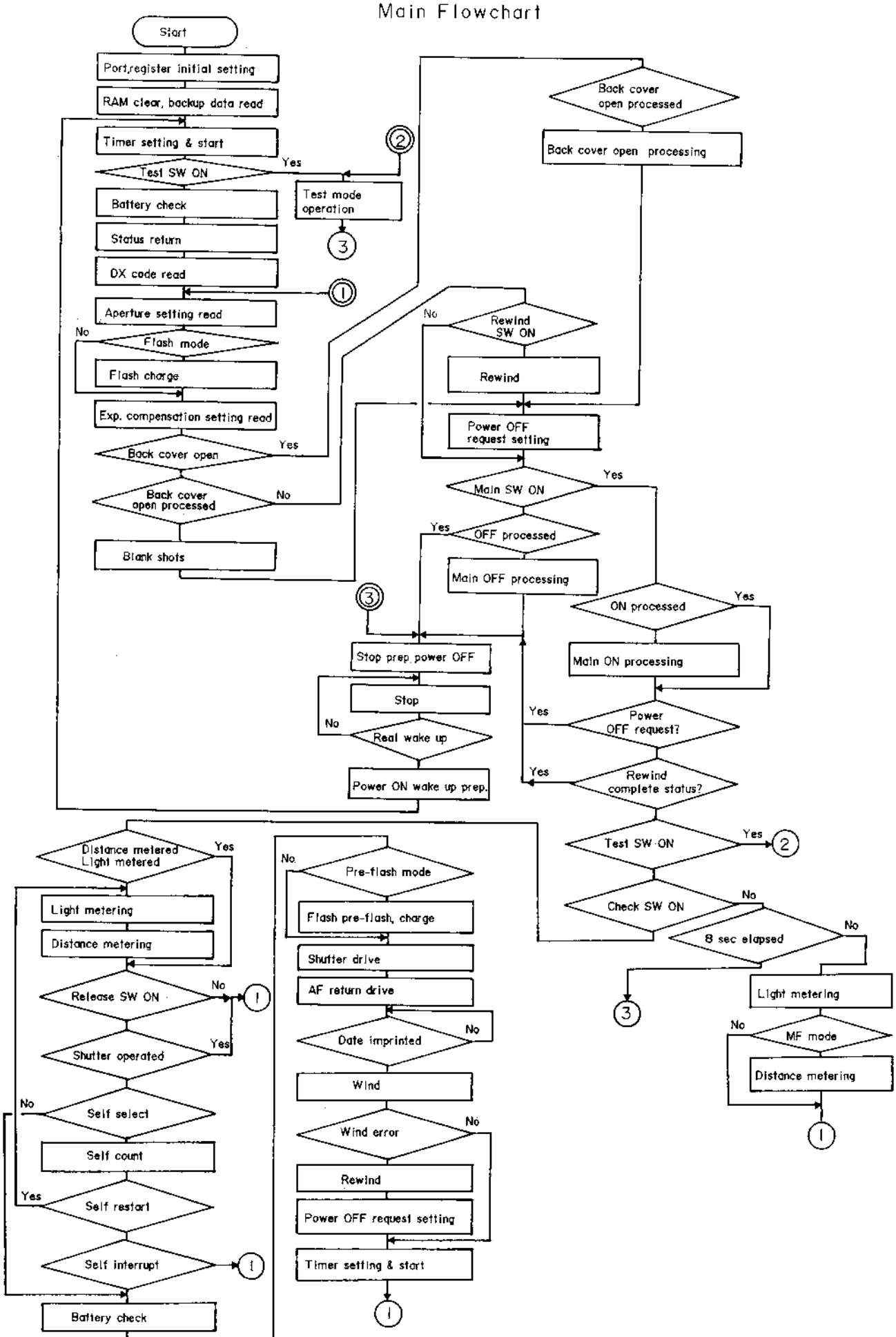
With 5 to 8 performed, one release sequence operation comes to an end. Then 8 seconds of power hold takes place. If check release is ON even after the end of release sequence, AE and AF are locked, so that you can check the operated shutter speed and AF status by the indications.
For mechanical operation of 5 to 8, opration status data are written into EEPROM immediately before that, and at the end of opration the normal ending is written in the EEPROM as a normal status. In case of error stop during operation, the operation is stopped (power OFF) immediately, and a normal state is restored in status return at the next power ON.

## Flash Timing (Pre-flash Mode)




Unless pre-flash mode is set, there will be no pre-flash,flash recharge and one-second wait.

# Main Flowchart

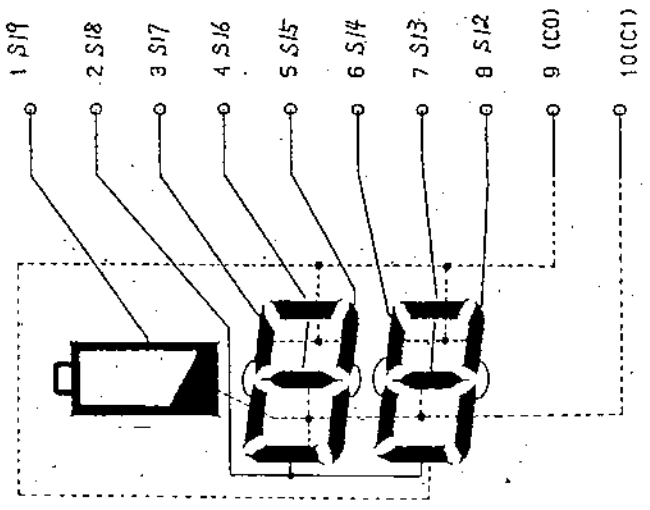


## IC FUNCTIONS AND DESCRIPTION OF TERMINALS

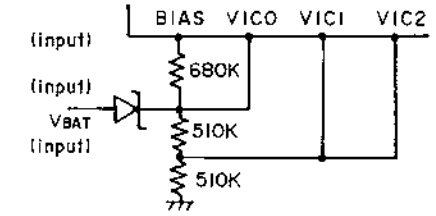
1 IC101 is CPU to perform general input checks and system control.
Its function include Power ON control, input switching, data check, timing control, mechanical system control, and display control.

| Pin No. | Code | Signal | Description of terminals |
|---|---|---|---|
| 1 | BP7 | AE-ST | Sampling signal (output) to analog IC (IC2) for light metering (SP).<br>Sampling signal is "H" signal of 9.77ms. |
| 2 | BP6 | CS | Chip select signal (output) for EEPROM (IC103), "H" active |
| 3 | BP5 | DATE | Date imprint signal (output), "H" active, Signal output for time corresponding to ISO code at end of shutter operation.<br>Ex. 80ms for ISO100 |
| 4 | BP4 | PRE | Protect register enable control (output) of EEPROM (IC103) |
| 5<br>6<br>7<br><br><br>74<br>75<br>76 | BP3<br>BP2<br>BP1<br><br><br>P61<br>P62<br>P63 | MD-M2<br>MD-M1<br>MD-S1<br><br><br>MD1<br>MD2<br>MD3 | Motor select signal (output) |

| BP3 | BP3 | BP1 | P63 | P62 | P61 | Motor select |
|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | Motor OFF |
| 0 | 1 | 0 | 0 | 0 | 1 | Wind ON |
| 1 | 0 | 0 | 1 | 0 | 0 | Rewind ON |
| 0 | 1 | 0 | 0 | 1 | 0 | AF (retract barrel) advance |
| 1 | 1 | 0 | 1 | 0 | 0 | AF (retract barrel) retract |
| 0 | 0 | 0 | 1 | 1 | 0 | AF (retract barrel) brake |
| 0 | 1 | 1 | 0 | IN2 | IN1 | Shutter |

| | | | |
|---|---|---|---|
| 8 | BP0 | STB | Strobe signal (output) for LED display drive IC (IC102) |
| 9~ 12 | S23~S20 | N.C | Not used |
| 13<br>14<br>15<br>16<br>17<br>18<br>19<br>20<br>21<br>22 | S19<br>S18<br>S17<br>S16<br>S15<br>S14<br>S13<br>S12<br>COM0<br>COM1 | SEGMENT SIG.<br>"<br>"<br>"<br>"<br>"<br>"<br>"<br>COMMON SIG.<br>" |  |

| Pin No. | Code | Signal | Description of terminals |
|---|---|---|---|
| 23, 24 | COM2, 3 | N.C | Not used |
| 25 | BIAS | LCD BIAS SIG. | Bias signal for LCD lighting (output) |
| 26 | VICO | " | " (input) |
| 27 | VICI | " | " (input) |
| 28 | VIC2 | " | " (input) |
| | | | Set for ½ duty ½ bias |
| 29 | P40 | SELF-L | Signal (output) for self LED lighting, Lighting at "L" |
| 30 | P41 | LEDENA | F-LED lighting control signal (output)<br>Lighting at "L", All except " ϟ " going out at "H" |
| 31 | P42 | PINT-L | In-focus LED " ● " lighting signal(output),Lighting at "L" |
| 32 | P43 | STRB-L | Flash LED " ϟ " lighting signal (output), Lighting at"L" |
| 33 | Vss | GND | Ground terminal of IC1 |
| 34 | P50 | AF-ST | Distance metering start signal (output) for distance metering (AF) IC (IC301), Distance metering started at 1ms "L" output of this terminal |
| 35 | P51 | PI-W | LED lighting signal (output) of photocoupler for perforation check at winding and rewinding, Lighting at "L" |
| 36 | P52 | PI-AF | LED lighting signal (output) of photo-coupler for drive check at retract barrel (AF) drive, Lighting at "L" |
| 37 | P53 | INT4 CONT | INT4 (38Pin) input level control signal (output), "H" output at power OFF |
| 38 | INT4 | FSET-P | Pulse SW (input) for ON/OFF with focus dial rotation, Power ON start at ON/OFF edges |
| 39 | SCK | SERIAL CLOCK | Clock terminal (output) for serial input/output, 262KHz clock at serial data input/output |
| 40 | SO | SERIAL DATA OUT | Serial data output terminal (output) |
| 41 | SI | SERIAL DATA IN | Serial data input terminal (input) |
| 42 | INTO | PI-P | Photo-coupler pulse input terminal (input), wave-shaped by IC2 |
| 43 | INTI | B-COV | Back Cover SW (input), ON ("L") at back cover open, OFF ("L") at back Cover close, Power ON start at ON/OFF edges |
| 44 | INT2 | SH-SW | Shutter drive timing SW (input), ON and OFF during Shutter drive, Time count started at ON ("H") and going OFF ("L") at end |



| Pin No. | Code | Signal | Description of terminals |
|---|---|---|---|
| 45 | TIO | AF-D | Exteral event counter (input), Distance metering data of AF-IC (IC301) input to this terminal as pulse |
| 46 | P20 | DX0 | DX code SW (input), IS025 to 5000 judged by 5 bits |
| 47 | P21 | DX1 | |
| 48 | P22 | DX2 | |
| 49 | P23 | DX3 | |
| 50 | P30 | DX4 | |
| 51 | P31 | G.CONT | Flash emission trigger signal (output),Pre-flash 40μS,Flash 4ms"H" |
| 52 | P32 | CHG | Flash charge control signal (ontput), charge ON at "H" |
| 53 | P33 | PO-SW | Power circuit control signal (output), Boost by IC201 started by "H" output at power ON start, "L" output at power OFF |
| 54 | P80 | PO-CHK | Terminal (input) for check of low battery during motor drive, Motor drive and cicuit operation stopped when B2 (12pin) terminal of IC2 is checked and the input goes "L" |
| 55 | P81 | S3 | Self-timer select SW (input), Self-timer select at ON ("L") |
| 56 | P82 | BCD1 | Retract barrel code SW (input) |
| 57 | P83 | BCD2 | Retract barrel code SW (input) |

| | Main OFF | Main ON | AF range | Close range limit |
|---|---|---|---|---|
| BCOD1 | ON | OFF | OFF | ON |
| BCOD2 | OFF | OFF | ON | ON |

| | | | |
|---|---|---|---|
| 58 | AN0 | ASET | Aperture setting analog input terminal |
| 59 | AN1 | FSET | Focus dial setting analog input terminal |
| 60 | AN2 | ± | Compensation dial setting analog input terminal |
| 61 | AN3 | TEMP | Temperature change check analog input terminal |
| 62 | AN4 | B.C | Battery level check analog input terminal |
| 63 | AN5 | C.UP | Flash change level check analog input terminal |
| 64 | AVss | GND | Analog input ground terminal |
| 65 | $AV_{ref}$ | A/D REF. VOLTAGE | A-D conversion ref voltage input terminal, 5V input after boosting and regulation |
| 66 | Vdd | SUPPLY VOLTAGE | Supply voltage input terminal of this IC, 5V or battery voltage (3V) input |
| 67, 68 | XT1, XT2 | | Crystal connection terminal for sub system click (32KHz) oscillation |
| 69 | IC | SUPPLY VOLTAGE | Program voltage input terminal |
| 70, 71 | X1, X2 | | Crystal/ceramic connection terminal for main system clock (4.19MHz) oscillation |
| 72 | RESET | | Input terminal forreset of this IC, at voltage drop during operation |

| Pin No. | Code | Signal | Description of terminals |
|---|---|---|---|
| | | | Reset to this IC upon detection of 2.4V ±2.5 by IC204 |
| 73 | P60 | AE-D | Light metering (input) terminal, Light metering data input from 8pin LAD of IC2 and output as function of time. 1EV: approx. 488μs step |
| 77 | KR4 | REW | On-demand rewind SW (input), Input for power ON start at OFF→ON irrespective of main ON/OFF, No rewind with back cover open |
| 78 | KR5 | TEST | Test mode SW (input), Power ON start at OFF→ON with main ON, This SW, normally covered with seal in cartridge chamber, used only at manual adjustment |
| 79 | KR6 | S2 | Release SW (Input) / Check SW (input) ) Power ON start at OFF→ON with main ON |
| 80 | KR7 | S1 | |

2 IC207 performs such functions as light metering, motor selection, voltage check shutter drive circuit voltage regulation control and pulse wave shaping.

| Pin No. | Code | Signal | Description of terminals |
|---|---|---|---|
| 1 | COM | | Light metering MOS amp (-) terminal |
| 2 | SPDI | | Light metering MOS amp (+) terminal |
| 3 | Vout | | Light metering MOS amp output terminal (output) |
| 4, 5 | N1, N2 | OFFSET | Not used (open) |
| 6 | CI | | Integration amp (-) terminal |
| 7 | CO | | Integration amp output terminal |
| 8 | LAD | LIGHT MET OUTPUT | Light metering output terminal (Comparator output), output to 73pin (AE-D) of IC1 |
| 9 | SPI | INTEG INPUT SW | Light metering sampling input terminal, input from 1pin (AE-ST) of IC1 |
| 10 | SP2 | GND | Not used |
| 11 | $V_{BJ}$ | | Battery check comparator input terminal, input from booster cicuit output |
| 12 | $B_2$ | | Battery check comparator output terminal 2 |
| 13 | $B_1$ | | Battery check comparator output terminal 1, H→L change at 288mV higher than $B_2$ |
| 14~23 | | MOTOR SELECT OUTPUT | |
| 25~28 | | MOTOR SERECT INPUT | |

| Pin No. | Code | Signal | Description of terminals |
|---|---|---|---|

| 28pin S1 | 27pin S2 | 26pin M1 | 25pin M2 | 23pin FO1 | 22pin RE1 | 21pin BR1 | 20pin FO2 |
|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Input | | | | Output | | | |

| Pin No. | Code | Signal | Description of terminals |
|---|---|---|---|
| 24, 43 | Vcc | SUPPLY VOLTAGE | Input of 5V regulated voltage |
| 29 | PULS | ← | Wave-shaped output terminal of PI (30pin) input, L-H reversal |
| 30 | PI | ← | Photo-coupler pulse input terminal |
| 31 | C . RESET | RESET OUTPUT | Not used (open) |
| 32 | IN | RESET INPUT | Not used (open) |
| 33 | COMP | | Motor driver regulated voltage amp (-) terminal (input) |
| 34 | MD | | Motor driver regulated voltage amp (-)output terminal |
| 35 | $V_{AF}$ | | Dummy light metering amp (-) input terminal, connected to Vs |
| 36 | Vs | REF. VOLTAGE | Reference voltage output terminal |
| 37 | Vss | GND | |
| 38 | $V_{J2}$ | | Is compensation amp (+) input terminal 2, connected to Vs |
| 39 | $V_{J1}$ | | Is compensation amp (+) input terminal 1, connected to Vs |
| 40 | JR | | Light metering reference amp (-) input terminal |
| 41 | VR | | Light metering reference amp (-) output terminal JR adjusted to 360mV |
| 42 | AE-SEL | | Not used (Supply voltage) |
| 44 | SPD2 | | Not used (open) |

3 IC301 is the AF (Auto Focus) IC. At the start signal from IC1, it emits distance metering LED light 16 times and outputs averaged data to IC1.

| Pin No. | Code | Signal | Description of terminals |
|---|---|---|---|
| 1 | GND | | |
| 2 | CH2 | HOLD CAPACITOR 2 | Putting 0.47$\mu$F capacitor between IC and GND |
| 3 | PSD2 | PSD INPUT 2 | PSD input on close distance |
| 4 | PSD1 | PSD INPUT 1 | PSD input on far distance |

| Pin No. | Code | Signal | Description of terminals |
|---|---|---|---|
| 5 | CHI | HOLD CAPACITOR I | Putting 0.47μF capacitor between IC and GND |
| 6 | Vcc | POWER TERMINAL | Application of 3V regulated voltage output |
| 7 | $\overline{DATA}$ | DATA OUTPUT | Auto Focus data output terminal, pulse count output: 0-255, Larger values for closer range, Counter content read 40ms after ST output of IC1 |
| 8 | $\overline{ST}$ | CONTROL | Auto Focus control input terminal, Auto Focus started at application of 1ms "L" pulse to this terminal (Rising start) |
| 9 | CINT | INTEG. CAPACITOR | Putting 0.033μF capacitor between IC and Vcc (3V) |
| 10 | $\overline{LED}$ | POWER PNP BASE | Output terminal for Auto Focus LED drive. ON 16 times upon input of ST signal |
| 11 | CL | EMIT CURRENT CONTROL | Output terminal for control of emit current of Auto Focus LED |
| 12 | OSC | OSCILLATOR CR | Terminal for clock with in this IC. CR put in parallel between IC and Vcc |

4 IC103 is a nonvolatile memory IC for backup storage of adjusted values and status data of the camera.

| Pin No. | Code | Signal | Description of terminals |
|---|---|---|---|
| 1 | PRE | PROTECT ENABLE | Rrotect enable input terminal for write protect of memory, Input from IC1 when adjustment data are to be rewritten in manual adjustment, etc. |
| 2 | Vcc | SUPPLY VOLTAGE | Input of 5V regulated voltage |
| 3 | CS | CHIP SELECT | Chip select input, "H" for read or write of this IC |
| 4 | SCK | SERIAL CLOCK | Serial clock input terminal, Input from IC1, 262KHz |
| 5 | DI | SERIAL DATA INPUT | Input of operation code, address and data from IC1 |
| 6 | DO | SERIAL DATA OUTPUT | Serial data output terminal, Internal state of READY/BUSY of this IC checked when serial data output is written in this IC (BUSY= "L") |
| 7 | GND | GROUND | Reference level of all inputs 0V |
| 8 | PE | PROGRAM ENABLE | Not used (open), with internal pull-up |

5 IC102,which is IC for F-LED indications,controls ON and OFF of 8 LEDs.

| Pin No. | Code | Signal | Description of terminals | |
|---|---|---|---|---|
| 1 | STB | STROBE SIGNAL | Terminal for input at switching output status, At "H", serial data is input and internal latch is switched. | |
| 2 | SI | SERIAL DATA INPUT | Terminal for input of serial data, Display data input from IC1 | |
| 3 | CLK | CLOCK INPUT | Shift clock input terminal, Shift clock (262KHz) input from IC1 | |
| 4 | Q1 | LT | LED lighting output signal, ON at "L", OFF at "H" | |
| 5 | Q2 | ± | " | |
| 6 | Q3 | ▶ | " | |
| 7 | Q4 | ◀ | " | |
| 14 | Q5 | P | " | |
| 13 | Q6 | 500 | " | |
| 12 | Q7 | 125 | " | |
| 11 | Q8 | 30 | " | |
| 8 | GND | | 0V ground | Input |
| 9 | Qs' | | Not used (open) | |
| 10 | Qs | | " | |
| 15 | OE | OUTPUT ENABLE | 5V connection (output always permitted) | input |
| 16 | Vcc | SUPPLY VOLTAGE | 5V | input |

6 IC201 is the IC to boost battery voltage to 6V.

| Pin No. | Code | Signal | Description of terminals |
|---|---|---|---|
| 1 | VI1 | SERIES $V_{IN1}$ | Not used (open) |
| 2 | REF | REFERENCE | Reference voltage input terminal |
| 3 | VI2 | SW.REG $V_{IN2}$ | Input of battery voltage (3V) |
| 4 | SCC | SW. CURRENT CONTROL | Input terminal for SW current control, connected to GND at 510Ω |
| 7, 5 | GND | GROUND | 0V |
| 6 | SW | SW INPUT | SW input with coil 100μH between 3pin and 6pin |
| 8 | OUT | OUTPUT | 6V output terminal |

7 IC205 is the motor IC for shutter drive.

| Pin No. | Code | Signal | Description of terminals |
|---|---|---|---|
| 1, 8<br>9, 16 | F-GND | GND | |
| 2 | Vcc | 5V | Power for control circuit |
| 3 | ENA1 | FO2 | Connected to 15pin ENA2, Input of signal to enable IC circuit |
| 4 | OUT1 | $\overline{O1}$ | Motor control output, IN1 "L" → "H", "H" → "L" |
| 5 | Vs1 | | Connected to 13pin Vs2, Input of motor power, Regulated (2.2V) voltage |
| 6 | OUT2 | $\overline{O2}$ | Motor control output, IN1 "L" → "L", "H" → "H" |
| 7 | IN1 | MD1 | Motor control input, control input of OUT1 and OUT2 |
| 10 | NC | | |
| 11 | IN2 | MD2 | Motor control input, control input of OUT3 and OUT4 |
| 12 | OUT4 | $\overline{O4}$ | Motor control output, IN2 "L" → "L", "H" → "H" |
| 13 | Vs2 | | Connected to 5pin Vs1 |
| 14 | OUT3 | $\overline{O3}$ | Motor control output, IN2 "L" → "H", "H" → "L" |
| 15 | ENA2 | FO2 | Connected to 3pin |

8 IC206 is the motor IC for winding,rewinding and AF (retractable barrel) drive.

| Pin No. | Code | Signal | Description of terminals |
|---|---|---|---|
| 1 | IN1L | RE1 | Motor control input, ON of OUT1 L |
| 2, 15 | OUT1 | | Motor drive output, connecting to wind motor (+) |
| 3 | GND | GND | Input terminal other than 6pin, connecting to GND (OUT2, OUT1) |
| 4, 13 | OUT2 | | Motor drive output, connecting to wind motor/AF motor (-) |
| 5 | IN2L | FO1 | Motor control input, ON of OUT2 L |
| 6 | GND | GND | Input terminal other than 3pin, connecting to GND (OUT3) |
| 7, 10 | OUT3 | | Motor drive output, connecting to AF motor (+) |
| 8 | IN3L | BR1 | Motor control input, ON of OUT3 L |
| 9 | IN3H | $\overline{MD2}$ | Motor control input, ON of OUT3 H |
| 11 | Vcc | $V_{BAT}$ | Input other than 14pin, connecting to $V_{BAT}$ (OUT3) |
| 12 | IN2H | $\overline{MD3}$ | Motor control input, ON of OUT2 H |
| 14 | Vcc | $V_{BAT}$ | Input other than 11pin, connecting to $V_{BAT}$ (OUT2, OUT1) |
| 16 | IN1H | $\overline{MD1}$ | Motor control input, ON of OUT1 H |

9 IC202 is the voltage regulator to supply 5V to the circuits.

| Pin No. | Code | Signal | Description of terminals |
|---|---|---|---|
| 1 | GND | G | Connecting to (-) of main power supply |
| 2 | Vin | I | Voltage detection input terminal, input of voltage boosted by IC201 |
| 3 | Vout | $\overline{O}$ | Terminal to supply regulated voltage to circuits |

10 IC302 is the voltage regulater to supply specified voltage (3V) to AF-IC (IC301).

| Pin No. | Code | Signal | Description of terminals |
|---|---|---|---|
| 1 | GND | G | Connecting to (-) of main power supply |
| 2 | Vin | I | Voltage detection input terminal, input of regulated voltage output (5V) of IC202 |
| 3 | Vout | $\overline{O}$ | Terminal to supply regulated voltage (3V) to AF-IC (IC301) |

11 IC204 is the supply voltage defector to control CPU (IC101) operation. $\overline{\text{RESET}}$ works when Vdd (66pin) of CPU drops below 2.4V (±10%).

| Pin No. | Code | Signal | Description of terminals |
|---|---|---|---|
| 1 | OUT | $\overline{O}$ | Output terminal going "L" when $V_{DD}$ drops below 2.4V, Resetting CPU (IC101) |
| 2 | VDD | Vcc | Power input terminal, connecting to 5V regulated voltage output via diode |
| 3 | VSS | Vss | Connecting to (-) of main power supply |

12 IC104 is the analog SW IC to control the level of INT4 (pin37) of CPU (IC101).

| Pin No. | Code | Signal | Description of terminals |
|---|---|---|---|
| 1 | IN/OUT | INT4 | Power ON start input of IC101, connecting to INT4 (output) |
| 2 | IN/OUT | FSET-P | Connecting to GND via focus dial SW contact and silding resister (input) |
| 3 | Vss | GND | Power input, connecting to (-) of main power supply |
| 4 | CONT | INT4 CONT | INT4 input level control input terminal (power ON→ "L", power OFF→"H") |
| 5 | $V_{DD}$ | $V_{DD}$ | Power input, connecting to Vdd (Connecting to 5V or $V_{BAT}$ via diode) |

13 IC105 is the analog SW IC to control the analog input level of the sliding resistor of the focus dial.

| Pin No. | Code | Signal | Description of terminals |
|---|---|---|---|
| 1 | IN/OUT | FD DIAL H | Connecting to "H" reference voltage of focus setting sliding resister (output) |
| 2 | IN/OUT | 5V | Switched input, connecting boosted and regulated power (5V) |
| 3 | Vss | GND | Power input, connecting to (-) of main power supply |
| 4 | CONT | PO-SW | Connecting to power SW output of IC101, Power OFF → "L" and output (1pin) → GND |
| 5 | $V_{DD}$ | $V_{DD}$ | Power input, connecting to Vdd |

14 IC106 is the 1 gate C-MOS IC to control the PRE terminal of EEPROM (IC103). (NOR-Gate)

| Pin No. | Code | Signal | Description of terminals |
|---|---|---|---|
| 1 | INA | $\overline{PRE}$ | Inversion input signal of PRE("H" active), Input from CPU(IC101) |
| 2 | INB | REW | Rewind SW input connected (input) |
| 3 | Vss | GND | Connecting to (-) of main power supply |
| 4 | OUT | PRE | PRE output, cancelling write profect of EEPROM (IC103), output at setting |
| 5 | VDD | Vdd | Connecting to circuit power Vdd |

CPU (IC101)

(1) Outline of functions

①Power control

②Switch input check

③Reading of DX code,exposure compensation data,aperture setting data, focus dial data

④Data communication with EEPROM

⑤Fetching and calculation of light metering and Auto Focus data

⑥Temperrature detection and calculation for tempereture compensation

⑦LED and LCD display control

⑧Retractable barrel (barrier) and drive control

⑨Shutter drive control

⑩ Winding and rewinding drive control

⑪ Data imprinting timing control

⑫ Flash charge and flash emission control

(2) Power supply

At battery introduction,the CPU makes a reset start at 3V and turns on the booster switch. At normal power ON (power hold),it will boost voltage and runs at 5V. At the end of power hold or power OFF,the booster switch is turned OFF, displayins the LCD at 3V and entering stop mode. If there is a power ON start input at this point,the booster switch will be turned ON and the CPU will start for 5V operation. If the voltage applying to the CPU drops below 2.4V,the CPU will be reset by the reset IC.

Power OFF

While the power is ON, the camera operates by high-soeed clock of 4.19MHz. In the stop mode after power OFF, it will operate by the low-speed clock of 32KHz. In the stop mode,LCD (no blinking indication) only is controlled and a stop mode cancel input is waited. The current consumption at this time is about 10A.
When there is blinking indication,the system is boosted once every count cycle (11.73ms) set by the timer to perform counting for blinking,turning the lights ON and OFF before entering stop mode again.
Start-up from the stop mode takes place at any of the following power ON start inputs:

①When the main power is ON or OFF
- Back cover switch change
- Main switch change
- Rewind switch ON

| | |
|---|---|
| ②Only when the Main Switch is ON | • S1 (check switch) ON<br>• S2 (release switch) ON<br>• Test switch ON<br>• Focus dial setting change |

Power hold

Power is hold ON for about 8 seconds after start-up from stop mode (Main Switch OFF⟶ON,S1 ON with Main Switch ON change of focus dial setting). When the switch (S1 or S2) is operated or any of the settings of the exposure compensation dial,aperture setting dial and focus setting dial is changed during this time,the power hold is extended by another 8 seconds from that point (SW OFF).

FUNCTION OF SWITCHES

(1)Main Switch (Focus Dial Pulse) INT4
This switch turns ON and OFF during the sliding motion of the focus dial. See the setting positions of the focus dial, the ON/ OFF state of the switch and the voltage values by sliding resistance elsewhere. Power ON start takes place at the edge of ON or OFF of this switch. The main switch is ON in the range of AF to MF0.7.

(2)Back Cover Switch (B.COV) INT1
This switch turn ON ("L") at the opening of the back cover and OFF ("H") at its closing.
Blank shots winding is started at the closing of the back cover. The start of open back cover is stored at the opening of the back cover.
This is a power ON start input that rises irrespectire of the start of the main switch (ON or OFF).

(3)On-demand Rewind Switch (P70)
This switch for starting the film midway through the roll rewinding is effective only when the back cover is closed.
This is a power ON start input that rises irrespective of thee start of the main switch (ON or OFF).
Without film,rewinding continues three seconds if the back cover is closed.

(4)Test Switch (P71)
This test mode switch is used only when test mode is required.
Located inside the film cartrige chamber,the switch is normally covered with a seal.
This switch is a power ON start input that can rise only when the main switch is ON.

(5)S1 (Check) Switch (P73)
This switch is a power ON start input that can rise only when the main switch is ON.
By oprating this switch,you can check the calculation results of light metering and distance metering within the viewfinder.
With the switch ON, AE and AF will be locked when the focus dial is at AF position. And AE only will be locked if the dial is at any of ∞to 0.7m positions.
Distance is metered two times a second,and the result of distance metering is compared with the dial setting, thus lighting the near focus,in-focus or for focus LED indicator.
At the turning OFF of this switch,the 8-second counting of power hold is started. During this time,light metering only is displayed repeetedly if the focus dial is in the AF position. But if the focus dial is in ∞ to 0.7m position,the light metering is repeated, AF performed twice a second and the results displayed in the viewfinder. And if there is no change in the setting of the focus dial,exposure compensation dial and aperture setting during this time and besides this check switch is not turned ON,then the power will go OFF in 8 seconds.
Where there has been a change in dial setting during the 8 seconds of power hold, the power hold resumes when the change is removed. Also where the check switch has been turned ON,it will start when the switch is turned OFF.

(6)S2 (Release) Switch (P72)
This switch is a power ON start input that can rise only when the main switch is ON.

This double switch of check and release does not normally turn ON alone,but Release ON follows check ON .
With this switch on self-timer counting starts at ON of the Self-timer switch mentioned below and release sequence starts at OFF of the Self-timer switch.

(7)Self-timer Switch (P81)
This self-timer selector switch is not a power ON start input.
With this switch turned ON,the self-timer mode is selected.
In the test mode,there is another usage for this switch. (See section on manual adjustment.)

(8)BCODE2 (P83),BCODE1 (P82)
Retractable barrel (AF) code switch
Code switch to show the status of retractable barrel (lens barrel) position

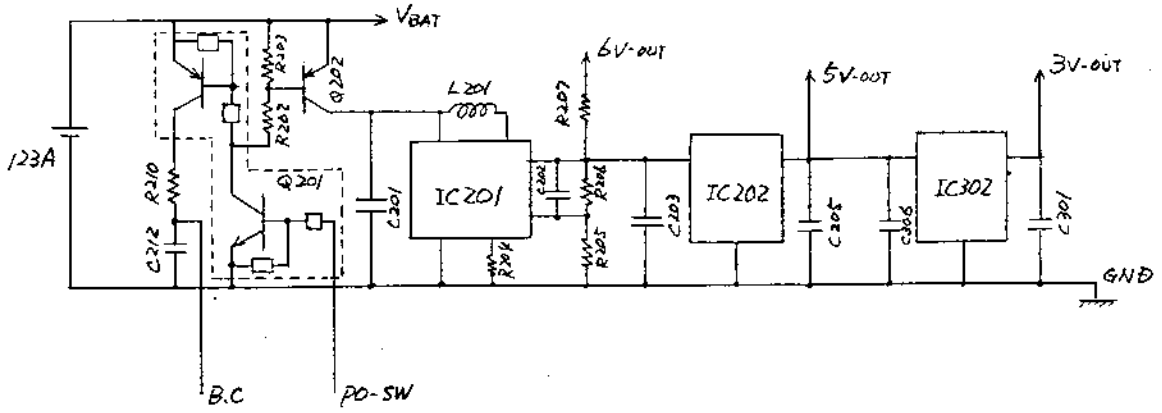
| Position / SW | (Main OFF) Barrier Close | (Main ON) AF Reset | AF Range | Close Range Limit |
|---|---|---|---|---|
| BCODE1 | ON | OFF | OFF | ON |
| BCODE2 | OFF | OFF | ON | ON |

(9)SH-SW (INT2)
Timing switch during shutter drive. This switch,which is normally OFF,turns ON and OFF during shutter opration. Time counting for control is started at ON of this switch,and the shutter is closed upon detection of the passage of the time. OFF is confirmed at the and of operation.

(10)DX0-4 (P20 ~ 23,P30)
This is a switch input to read ISO code. The contact piece is projecting inside the film cartridge chamber.
In the test mode,there is another usage for this switch. (See section on manual adjustment)

## DESCRIPTION OF ELECTRICAL CIRCUITS

(1)Power Supply,Battery Check and Reset Circuits




The DC-DC converter,which is started and boosted by the power switch of the CPU, outputs 6V.

$V_{BAT}$ : Battery power input (+),Input directly to CPU, shutter drive circuit, motor drive circuit,flash circuit,self-timer LED drive circuit.

GND : Battery power input (-)

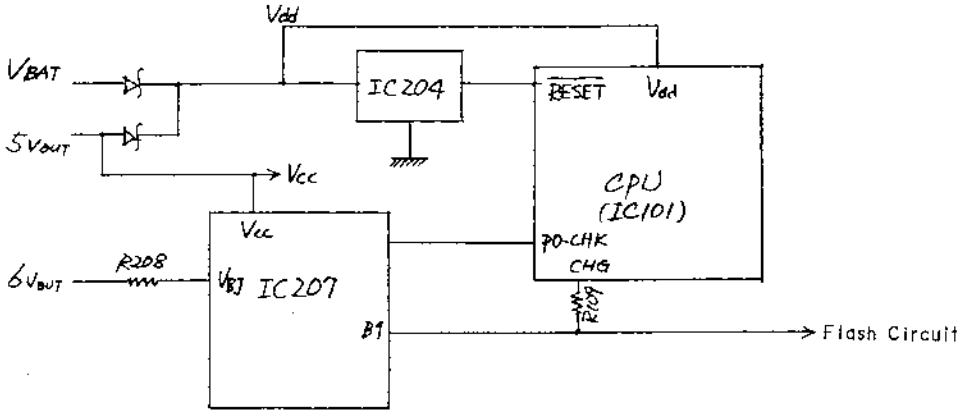
$6V\text{-}_{OUT}$ : Output boosted by IC201,used for AF distance metering LED drive.

$5V\text{-}_{OUT}$ : Boosted output regulated to 5V by IC202,circuit power at power ON.

$3V\text{-}_{OUT}$ : Output of 5V further regulated to 3V,power for AF-IC.

PO-SW : Input from CPU (P33) for boosting control of power circuit.

B.C : Output terminal for level check of battery power,CPU reading this level through A-D conversion with shutter coil loaded.

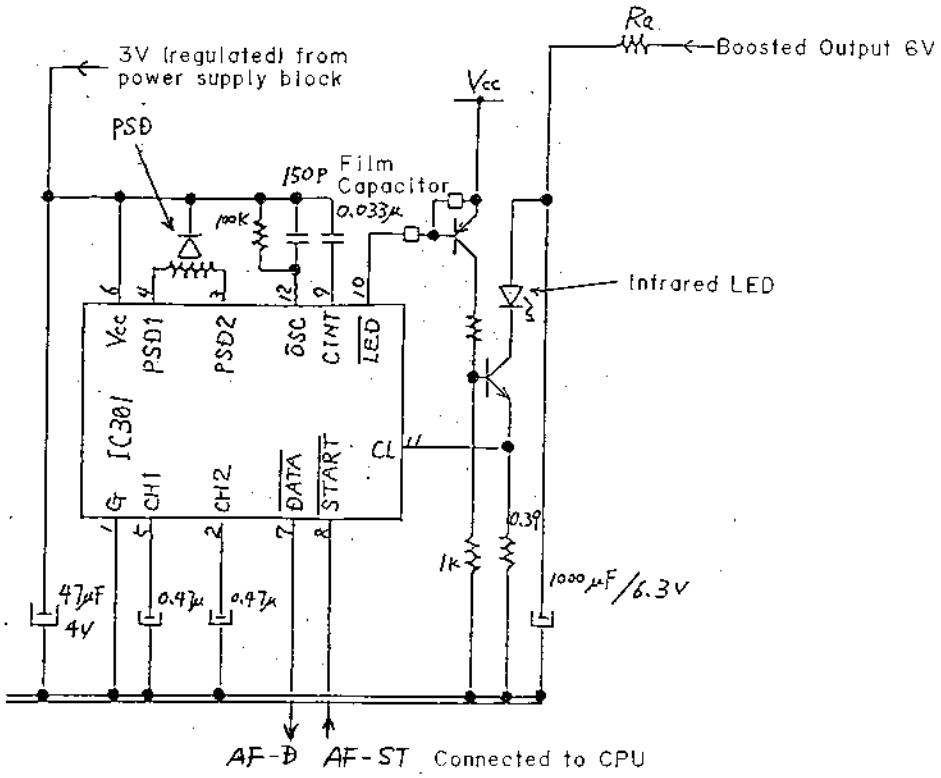



$6V\text{-}_{OUT}$ (boosted output) is input to the $V_{BJ}$ terminal of IC207 via resistance R208. The voltage input here is turned into "H" or "L" output at B1 and B2 according to the input voltage level.

That is, 5.4V (Vdd=4.8V) or below  B1 : "L"
5.1V (Vdd=4.5V) or below  B2 : "L"
This B1 functions to stop flash charge forcibly when the power-supply voltage (Vdd) of the CPU drops during flash charge. B2 causes an operation stop at the accidental drop of Vdd during CPU operation,which is defected by the monitoring of the CPU.
Vdd is being monitored by IC204 (reset IC).When this voltage drops to 2.4V or below, the CPU is subjected to a forced reset.

(2) Auto Focus Circuit

ⓐ Circuit diagram




ⓑ Circuit operation

1) Auto Focus starts at "L" ⟶ "H" of $\overline{\text{START}}$ (AF-ST of CPU : P50).

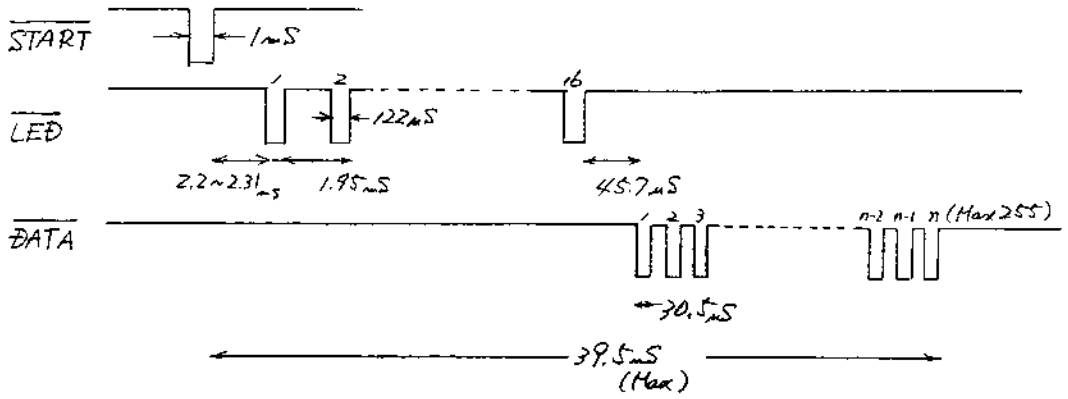
2) Auto Focus by 16 times of LED emission (122 μs every 1.95msec).

3) AF-IC performs digital conversion through analog integration.

4) Conversion produces an 8-bit pulse count (0 to 255), which is output to $\overline{\text{DATA}}$ (AF-D of CPU).

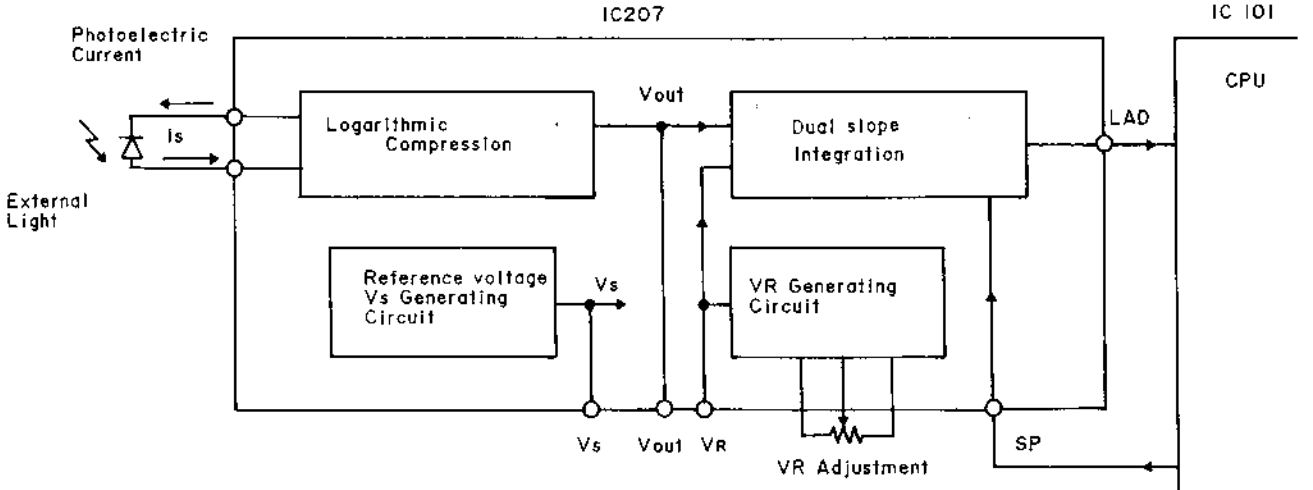
5) CPU counts the A-D pulse output by the event counter and reads out the value 40msec after giving a start signal.

Ⓒ Timing waveform




(3)Light Metering Circuit

The photoelectric current Is coming form the SPD is logarithmically compressed and converted to a light-metering output $V_{OUT}$ by IC207. $V_{OUT}$ is an analog voltage in linear relation ship with the Lv value (ISO=100). It is subjected to Dual slope integration by giving a reference pulse SP from outside in order to provide an interfase (V-t conversion) with IC101 (CPU) and cancel the temperature dependence. And LAD,which is one-shot pulse (Low active),is conveyed to IC101 as light metering data. (SP=9.8mS)




Light metering Block Circuit Diagram

Standard values

Vs ---- 1.2±0.05[V]  at25[°C] GND (reference)

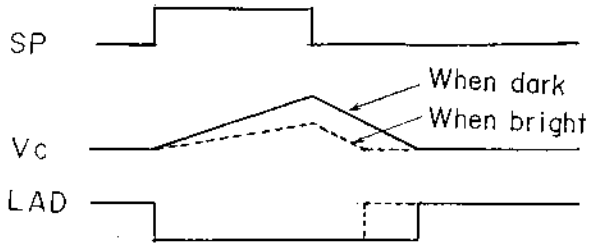
VR ---- 360±5[mV], semifixed resistance adjusted,at 25[°C] Vs (reference)

Is ----- 165[nA]typ. [Lv.12],on camera, min140～ max.206[nA]

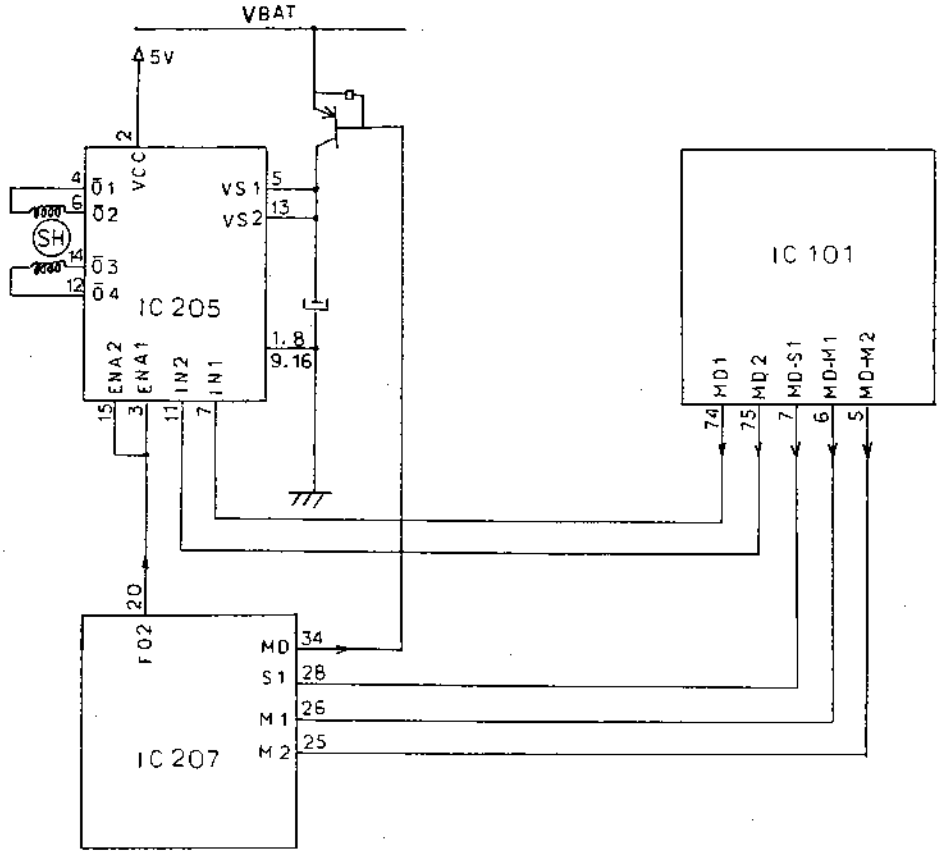
$V_{OUT}$ --- -145[mV] (Lv.12) at 25[°C] Vs (refernce) +18mV/Ev.
proportional to absolute temperature

LAD (SP+T2) ----13.9[mS] (Lv.12) -488μS/Ev.,no temperature dependence

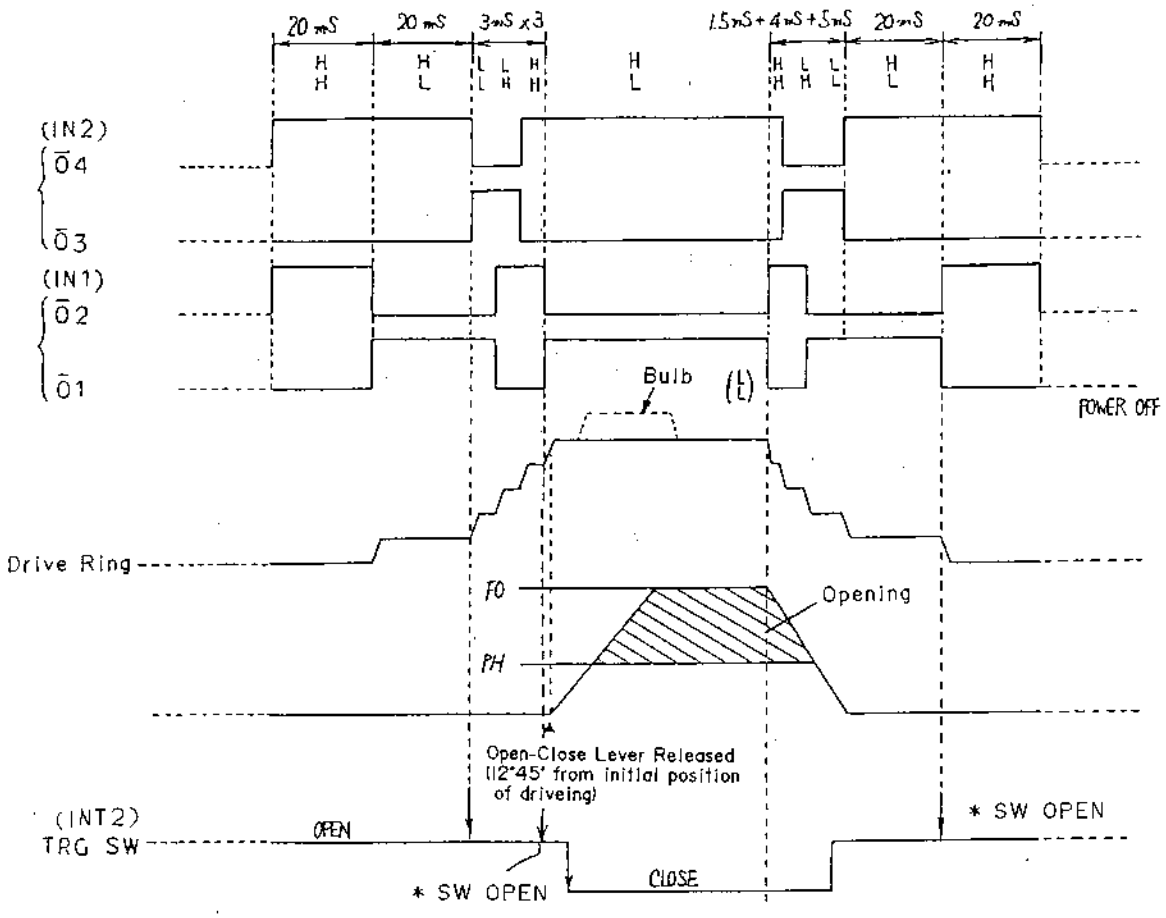
Timing




(4)shutter Drive Circuit

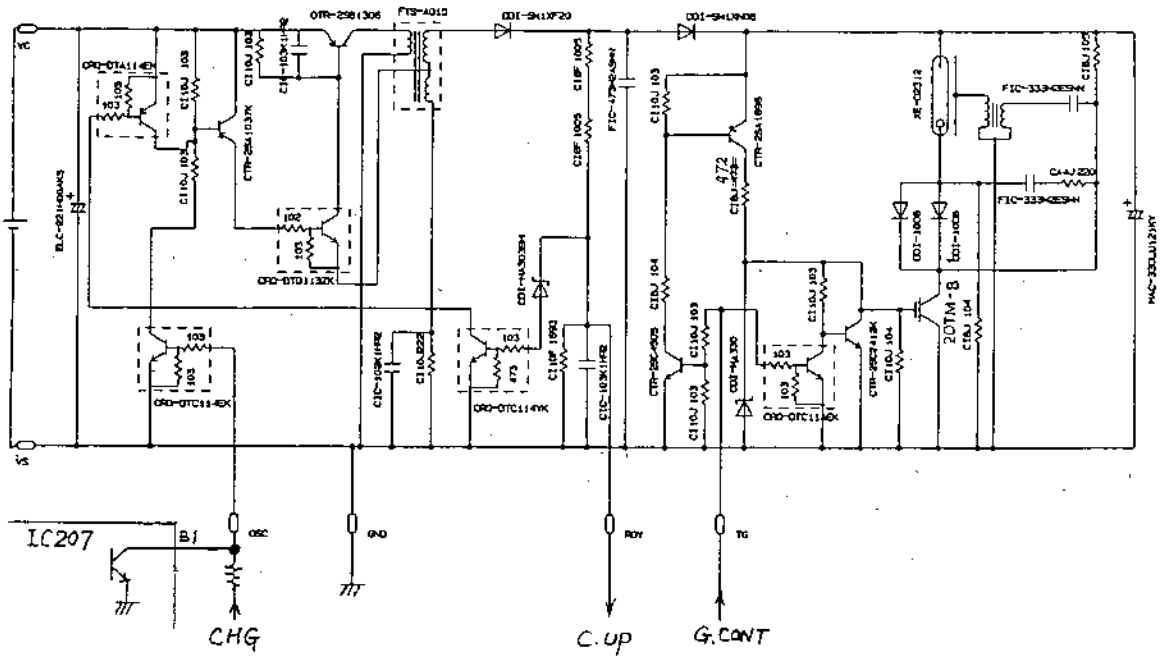


In shutter drive, at the output of the selection signal of IC207 Pin20 (F02), IC101 Pin7 (MD-S1) goes "H",Pin6 (MD-M1) gose "H" and Pin5 (MD-M2) goes "L". Here,outputs are made from IC101 Pin74 (MD1) and Pin75 (MD2). And at the control signals of IC205 Pin7 (IC1) and Pin11 (IC2),the stepping motor is run forward and reverse.




The timing waveform is as shown above. The sequence from the OPEN ⟶ CLOSE of TRG SW (INT2) to the reversing start corresponds to the shutter control time. And the circuit monitors the voltage applying to the shutter at the COMP of IC207.and produces 2.0V ±0.2 by the ON-OFF control of MD.
(*In the chart,the polarity of TRG SW is inverted from that of the circuit diagram.)

5 Flash Circuit




**TERMINALS**

| Flash terminal | IC101 (CPU) | | Function |
|---|---|---|---|
| | Terminal | Symbol | |
| OSC | # 52 | CHG | Charge control signal, OSC "H" : charge, "L" : stop |
| RDY | # 63 | CUP | Charge complete signal (analog), 2.3V output at 300V(Main Capacitor) |
| TG | # 51 | G.CONT | Flash control signal, "H" : flash, "L" : flash stop |

**OPERATION**

**CHARGE**

IC101 is set for ϟ and ϟϟ modes during power hold. And when the charge is insufficient,IC101 outputs theCHG signal "H" and the flash circuit starts charging. During charge,the comparator in IC207,which is monitoring the boosting line,lowers OSC to "L" automatically at the voltage of the boosting line,thus stopping the charge. Thus the charge system guarantees the boosting output.

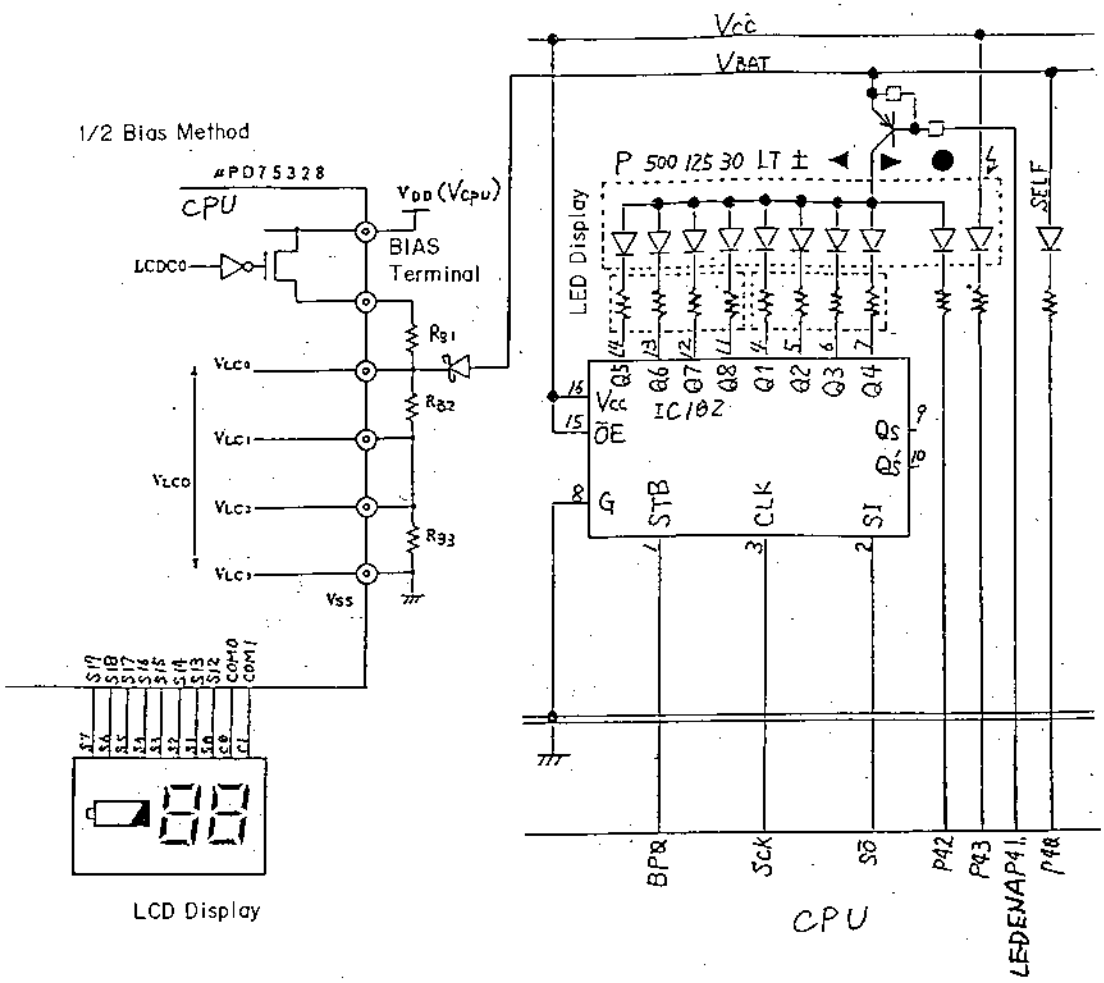
**CHARGE COMPLETE DETEDTION**

Charge is completed at Main Capacitor voltage=300V,The flash circuit divides the Main Capacitor voltage and conveys it as an analog voltage to IC101. AT 2.3V (equivalent to 300V),IC101 turns OFF the CHG signal. The flash,coming with an overcharge prevention circuit,stops charge automatically at 330V even when the camera is out of order.

**FLASHING**

While the TG terminal is kept "H" by IC101,IGBT in the flash is turned ON to emit a flash. The flashmatic unit performs 40 $\mu$ s pre-flash and full flash.

6 Display Circuit



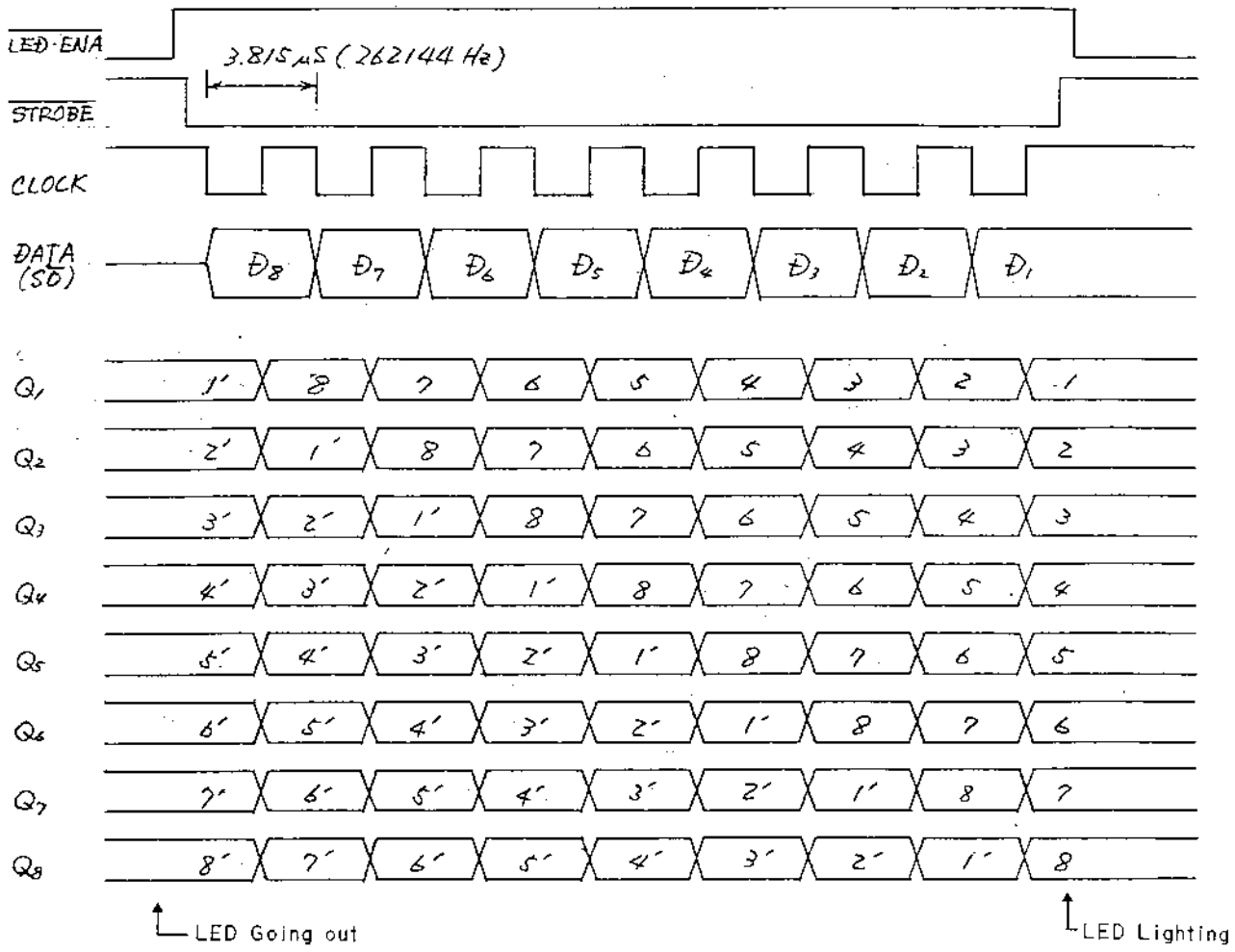

**1)LCD display**

The LCD is driven and controlled directly by the CPU (IC101).
Using a 1/2 bias 1/2 drive system, the CPU is in charge of the two-segment display of segment terminals S12 to S19.

**2)LED display**

SELF, ↯ and ● (In focus mark) are turned ON and OFF direectly by the CPU (IC101).
P,500,125,30,LT,±, ◀ and ▶ are turned ON and OFF by the shift register (IC102). And the display data are transferred from the CPU (IC101) in synchronism with the serial clock (SCK). The output terminals Q1 to Q8 light up at "L". STB goes "L" when the data is transferred by the above-mentioned serial clock. The system is such that the eight displays by the shift register and the ● (In focus mark) can be controlled ON and OFF altogether by P41 of the CPU (IC101). That is they are OFF during the shift operation of IC102 and turn ON after the completion of shift operation.

LED Display in Viewfinder by Shift Register




1' ~ 8' : Lighting for previous display (1~8) data

0("L") : Light up

D8 : 30

D7 : 125

D6 : 500

D5 : P

D4 : ◀

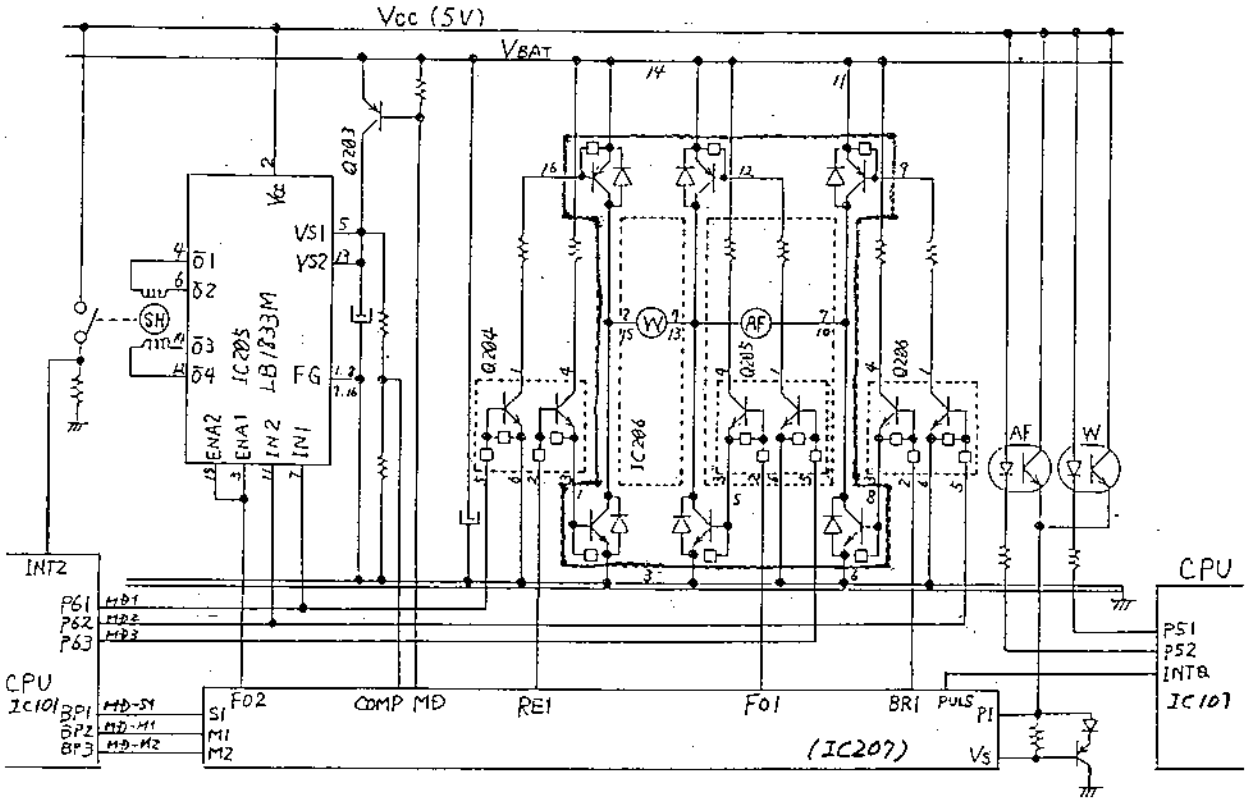
D3 : ▶

D2 : ±

D1 : LT

When you look into the viewfinder and find the subject brightness is low, the brightness of the LED is switched to clear the blur of the LED display. At EV 12.5 or below, therefore, the brightness of the LED is lowered by pulse drive (ON and OFF of LEDENA, Cycle 7.812mS, 1/4 Duty).

7 Wind, Rewind & AF (Retractable Barrel) Drive Circuit




| | MD3 | MD2 | MD1 | RE1 | FO1 | BRI | MD S1 | MD M2 | MD M1 |
|---|---|---|---|---|---|---|---|---|---|
| OFF | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wind | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| Rewind | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| AF Forward | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| AF Reverse | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| AF Brake | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

The wind, rewind and AF (retractable barrel) drive circuit is as shown above. And the motor and direction of rotation are selected as shown in the left table.
As for MD 1 to 3, MD-S1, MD-M1 and MD-M2, signal output is made the CPU of IC101.
MD 1 to 3 to are output, selected by the decoding cicuit of IC207.

In winding or blank shots, duty drive (cycle:3.96mS, 50%) is done from the last two pulses (4 pulses for blank shots) of perforation count, and the drive is stopped by plugging (14 to 30mSec) upon detection of the last perforation.
In rewinding, eight perforations are detected and then the film count is counted down (0 stop).

Absence of perforation pulse change for 3 seconds (6 seconds) is considered to be the end of film rewinding. At this point,the motor is stopped once and then rotated 125mS in the direction of winding so as to switch the epicyclic gears before coming to a stop.
AF (retractable barrel) drive consists of the pulse to detect the drive distance and pulse drive by the internal timer of IC101(CPU). It is basically as follows:

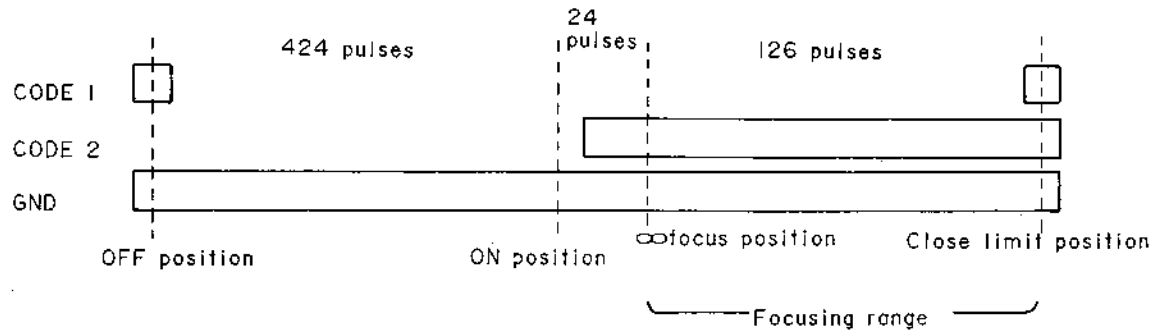
①Motor ON

②Motor OFF and time count start at pulse detection

③Motor ON when pulse does not come after completion of specified time count

④ Stop by reversing beake (14mS) on completion of specified pulse count or detection of code position

The speed control is realized by changing the with of timer setting.
The relationship between retractable barrel code and position is as shown below:




There are the following four kinds of AF (retractable barrel) drive:

①Main ON drive
From OFF position,the motor is run forward (advance) unitil ON of CODE2. Then the motor is stopped once,reversed and stopped at ON position by reversing brake upon detection of OFF of CODE2.
This is the drive when the Focus Dial is set to AF from OFF.

②AF setting drive
From ON position,the motor is run forward. Upon detection of ON of CODE2,it is further driven in the same direction by a specified AF drive pulse count (count including that from CODE2 ON to ∞ focus position) before stopping by reversing brake. This is the drive up to the foucus position (set position in MF) in release action.

③AF return drive
The shutter is operated after AF setting drive. And the lens is returned to the ON position before winding operation.

④Main OFF drive
This is the drive when the Focus Dial is set to OFF from AF.
It stops at the position of CODE2:OFF and CODE1:ON. During this time,the barrier undergoes Open to Close operation.
When the pulse dose not come or 1024 pulse is detected after detection of CODE2: OFF and CODE1:ON,the motor will stop without reversing brake.

8 Backup of Information

IC103(EEPROM) is a nonvolatile storage of 16bits × 64words (1024bits). This IC is capable of electrically writing,reading,and setting and resetting write protect.
Adjusted values (compensated values) for camera operations and calculations are written in this IC in the manufacturing process of the camera. And they are write-protected so as to avoid destruction by careless writing. On the other hand,the area of EEPROM is used for the backup of status information. The status information comprises 16bits,of which 8bits are for film counter (4bits × 2),3bits for status information,1bit for back cover Open (=1)/ Close (=0) information,and the remaining 4bits unused.
The IC stores the status of each operating function as the data for status reset operation when,for example,the battery has fallen out on some failure has stopped the camera operation during mechanical operation.

| | Status information | | | Status reset operation | Setting | Cancel (to normal state) |
|---|---|---|---|---|---|---|
| Shutter operation | O | O | O | Shutter return,AF return drive, wind drive | Start of shutter operation | End of shutter operation |
| Blank Shots | O | O | I | Restart of blank shots | Start of blank shots | End of blank shots |
| AF setting drive | O | I | O | AF return drive | Start of AF drive | End of AF drive |
| AF return drive | O | I | I | AF return drive & winding | AF return drive | At end of AF return drive |
| Winding | I | O | O | Start of winding | Start of winding | End of winding |
| Rewinding | I | O | I | Restart of rewinding | Start of rewinding | End of rewinding (without film) |
| Normal state | I | I | O | —— | —— | —— |
| End of rewinding | I | I | I | —— | Failure of blank shots<br>End of rewinding (with film) | Back Cover open |

The 16bits of information include film counter,which is backed up together with the above-mentioned status information.

**Read and Write Timing of EEPROM (IC103) Compensation Data**

(1)When the CPU made a reset start with a battery put in the camera, the contents of data (EEPROM addresses:10H-3FH) in the EEPROM are initially read out to the RAM on the CPU. The addresses on the RAM are 11C$_H$-1DA$_H$. The values can be checked and corrected by manual adjustment. The values read out at reset start are held on the RAM until the consumed battery is replaced (the next reset start of the CPU).(Adjusted values are not read out usually.)

(2)When an adjusted value has been corrected by manual adjustment (here a change of the value on the RAM of the CPU), turn OFF the Main Switch and turn ON the Rew Switch (on-demand rewind switch) in ending the adjustment mode if the new value is to be written in the EEPROM.
In this case, cancel the write protect covering address 10H and thereafter of the EEPROM, write all the adjusted value data on the RAM of the CPU into the EEPROM, and finally set the write protect again.

Except for (1) and (2) above, reading or writing of adjusted values is not done, and calculation and control processings are carried out according to the data stoved on the RAM.

**Contens of Adjusted Value Data**

① A/D value of battery check level

② Compensation value of light metering calculation

③ Compensation value of shutter delay

④ Total pulse count of AF drive

⑤ Drive pulse count up to AF ∞ position

⑥ AF drive pulse count at distance metering limit (8.3m)

⑦ Lens drive pulse count up to 5m, 1.67m, 1m, 0.7m

⑧ Distance metering (AF) data at 5m, 1.67m, 1m, 0.7m

⑨ Slope and intercept of linear equation of AF data and drive pulse count conversion

⑩ Reference A/D value for AF-IC data temperature compensation

⑪ Drive pulse count up to (true) ∞ position

⑫ A/D value of exp.compensation dial at +2.0 an -2.0

⑬ A/D cmpensation value of exp.compensation dial

⑭ A/D value of aperture dial at ϟ, 2.8, 16

⑮ A/D cmpensation value of aperture dial

⑯ A/D value of foucus dial at AF, 16m, 0.7m

⑰ A/D cmpensation value of foucus dial (OFF-AF, AF-∞, ∞ -16)

⑱ Slope and intercept of linear equation of A/D value compensation of focus dial

⑲ Compensation value of diaphragm ring exposure

⑳ Adjustment value of retractable barrel (AF) drive speed

㉑ Adjustment value of reversing brake time at end of winding or blank shots

㉒ A/D reference value of flash charge level

Of the above, ⑫ for ⑬ , ⑭ for ⑮ , and ⑯ for ⑰ and ⑱ are to corrected, so that the values calculated at data writing are set on the RAM and written in the EEPROM.
See the section on manual adjustment for details.

| LENS STATE | BARRIER CLOSE | ⟷ | AF RANGE | CLOSE LIMIT |
|---|---|---|---|---|
| RET. BARREL CODE 1 | ON | OFF | OFF | ON |
| RET. BARREL CODE 2 | OFF | OFF | ON | ON |
| P82 | 0 | 1 | 1 | 0 |
| P83 | 1 | 1 | 0 | 0 |

BACK ⟷ ADVANCE

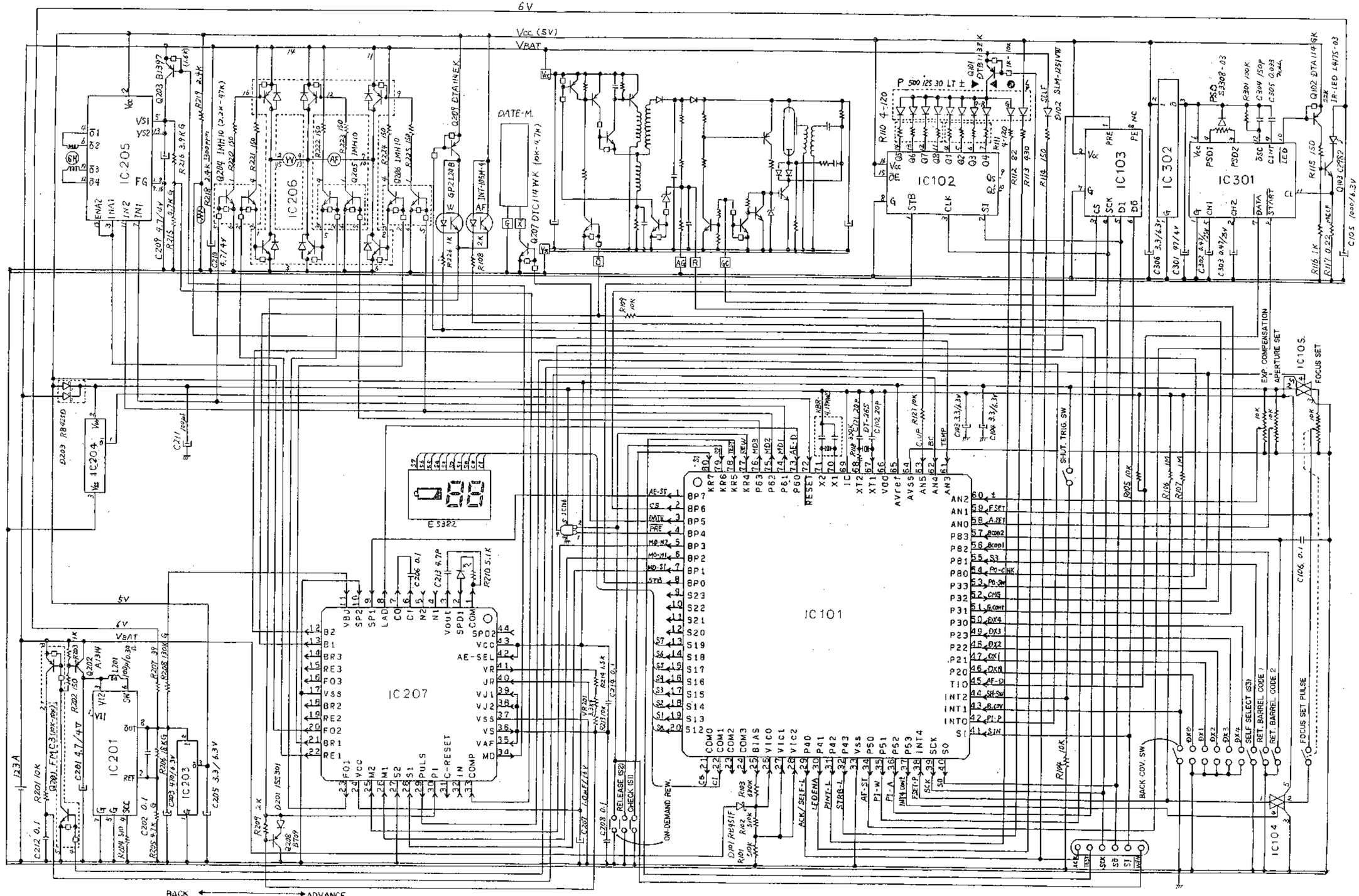
| BACK COV. | CLOSE | OPEN |
|---|---|---|
| B. COV. SW | OFF | ON |
| INT 1 | 1 | 0 |

| SHUTTER | CLOSE | OPEN |
|---|---|---|
| SHUTTER TRIGGER SW | OFF | ON |
| INT 2 | 0 | 1 |

| EXP. MODE | NORMAL | SELF |
|---|---|---|
| SELF SELECT | OFF | ON |
| P81 | 1 | 0 |

IC202 203 204 — IC104 105 106 — Q201 — Q204 205 206

OLD CIRCUIT DIAGRAM




| LENS STATE | BARRIER CLOSE | ← → | AF RANGE | CLOSE LIMIT |
|---|---|---|---|---|
| RET. BARREL CODE 1 | ON | OFF | OFF | ON |
| RET. BARREL CODE 2 | OFF | OFF | ON | ON |
| P82 | 0 | 1 | 1 | 0 |
| P83 | 1 | 1 | 0 | 0 |

BACK ← → ADVANCE

| BACK COV. | CLOSE | OPEN |
|---|---|---|
| B. COV. SW | OFF | ON |
| INT 1 | 1 | 0 |

| SHUTTER | CLOSE | OPEN |
|---|---|---|
| SHUTTER TRIGGER SW | OFF | ON |
| INT 2 | 0 | 1 |

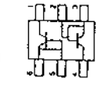
| EXP. MODE | NORMAL | SELF |
|---|---|---|
| SELF SELECT | OFF | ON |
| P81 | 1 | 0 |

IC203 204 302

IC 104 105 106

Q 201

Q 204 205 206



NEW CIRCUIT DIAGRAM

# B. DISASSEMBLY PROCEDURE

## B-1 Disassembly of Exterior Parts

### B-1-1 Removal of Battery Cap and Back Cover Ass'y

1)Remove the Battery Cap (3AQ125) by turning it in the direction of the arrow.
2)Open the Back Cover,and remove the Back Cover Ass'y (2AQA02) while pushing down the Back Cover release pin.

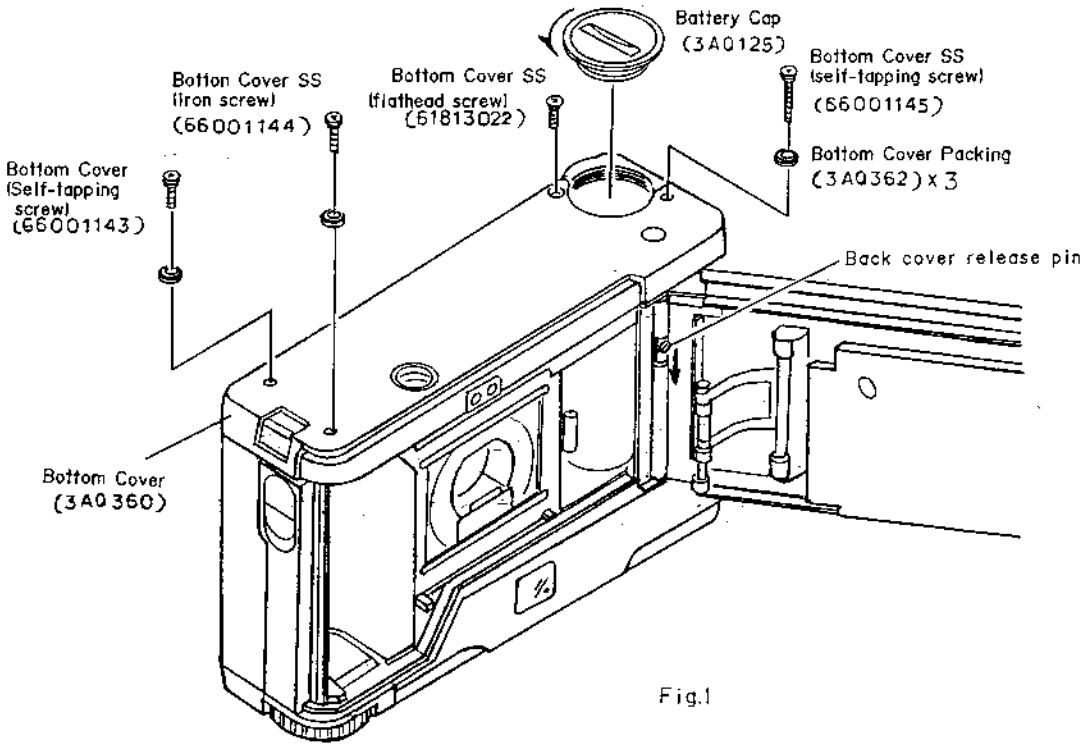



Fig.1

3)Remove the Bottom Cover Setscrews (66001143) (66001144) (66001145) and Bottom Cover Packings (3AQ362) X 3.
4)Remove the Bottom Cover Setscrews (61813022) and the Bottom Cover (3AQ360).

**Note: When installing the Bottom Cover,take can not to confuse the four Bottom Cover Setscrews,which are different in type and length.**

5)With the Botton Cover removed,the RW Botton Holder (3AQ650),RW Button (3AQ651) and Spacer (3AQ128) win come off.

Notes: a)The spacer is gulued to the Battery Cap Holder (3AQ126).
b)Where the camera comes with a strap attached to it,the Parallel Pin (66670130) is glued to the body. In this case,the Bottom Cover most be removed with case so as not to lose the Parallel Pin.

[Notes on installation of RW Button Holder]
a)Be sure to wipe cleaw the RW Button and the pattern area of the FPC with ether alcohol before installing the RW Button and RW Button Holder.
b)Make certain that when the RW Button Holder is set in place,the catches (2 points) of the RW Button Holder are securely engaged with the grooves is the MM Base Plate (Lower).

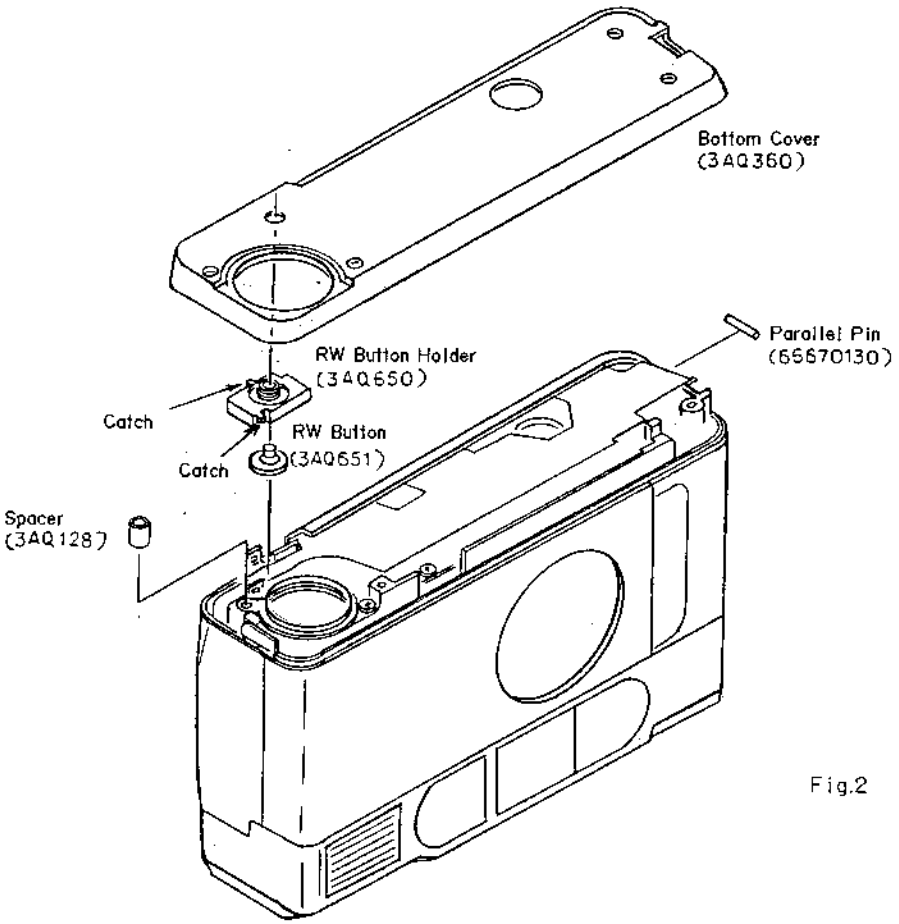



Fig.2

[Notes of reassembly of Top Cover]
a)Be careful not to pinch the lead wires when installing the Bottom Cover.

B-1-2 Removal of Top Cover Ass'y

1)Remove the Top Cover Ass'y (3AQA03) by taking out the Top Cover Setscrews (69113572) X 3.
2)With the Top Cover Ass'y removed, the Release Button (3AQ314) and Self-Timer Lever Ass'y (3AQA04) will come off.

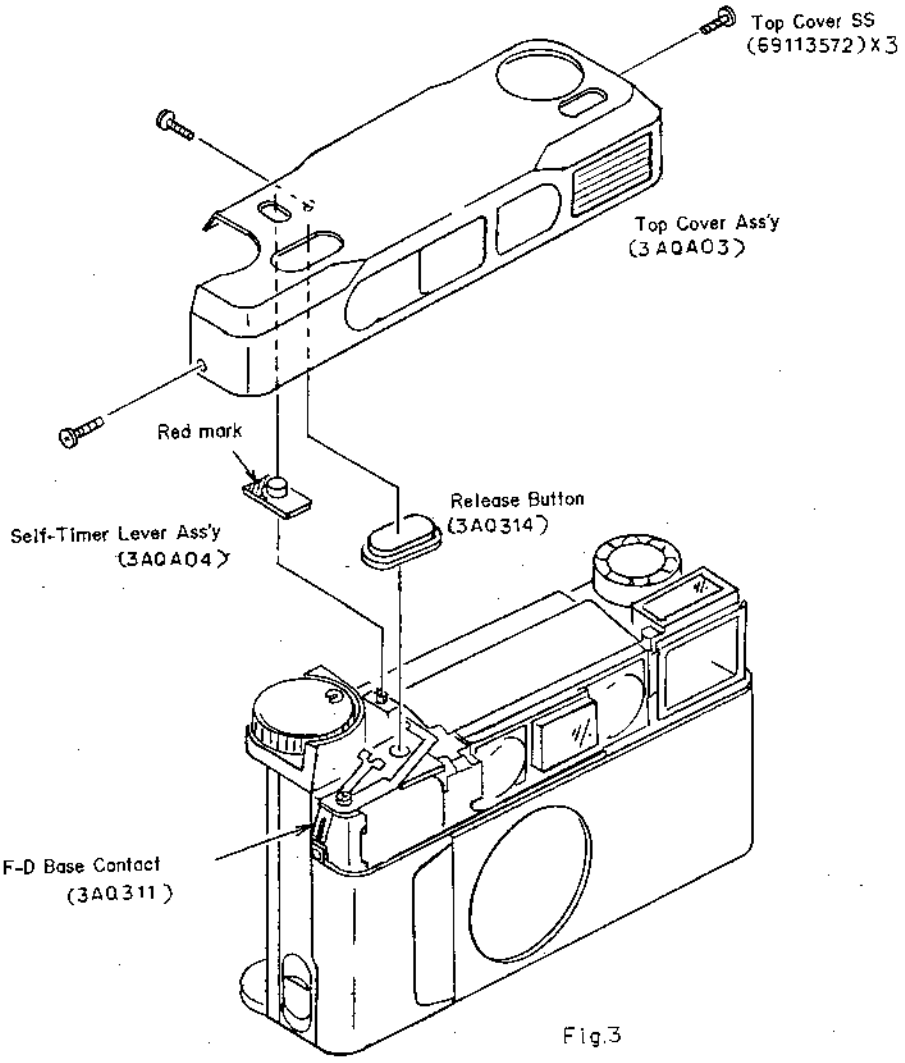


Fig.3

Note: After removal of the Top Cover Ass'y, take care not to bend the F-D Base Contact (3AQ311).

[Notes of reassembly of Top Cover]
a)Be careful not to pinch the lead wires when installing the Top Cver.

B-1-3 Removal of Front Cover

1)Take off the front Grip (3AQ353).

Notes: a)The Front Grip is fixed to the Front Cover with the Front Grip Tape (3AQ354).
b)Once the Front Grip is taken off, the Front Grip Tape will lose its adhesive strength. Therefore, use a new Front Grip Tape for installing the Front Grip.

2)Remove the Front Cover (3AQ350) by taking out the Front Cover Setscrews (693130576) X 2, (69315066).

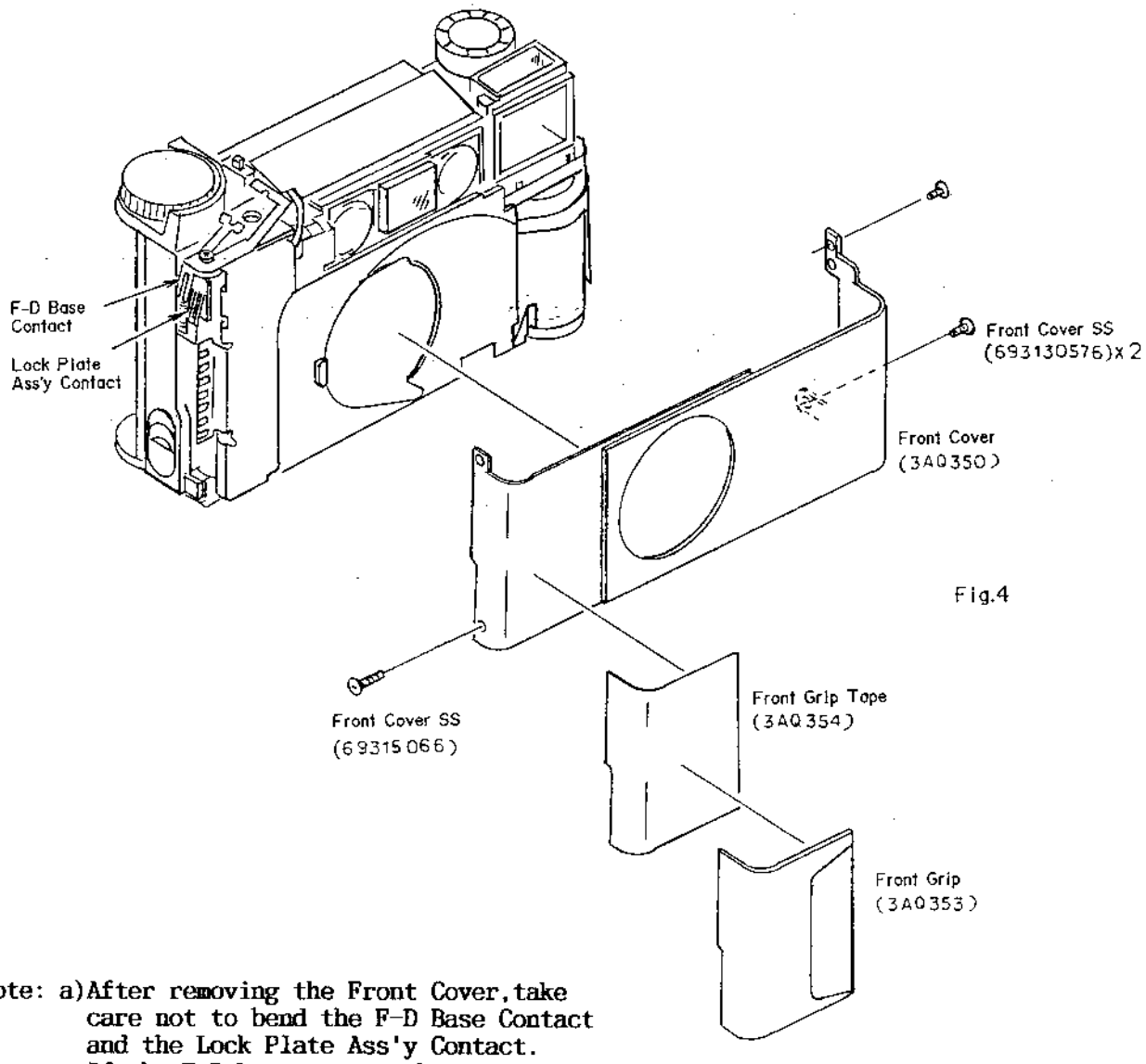



Fig.4

Note: a)After removing the Front Cover, take care not to bend the F-D Base Contact and the Lock Plate Ass'y Contact. If the F-D base contact, bent accidentally, is not in contact with the Top Cover, the CPU can be damaged by high static electrecity.

B-1-4 Removal of Hinge Holder Plate Base

1)Remove the Hinge Holder Plate (3AQ148) and Hinge Holder Plate Base (3AQ149) by taking out the Hinge Hlder Plate Setscrews (69314562) X 2.

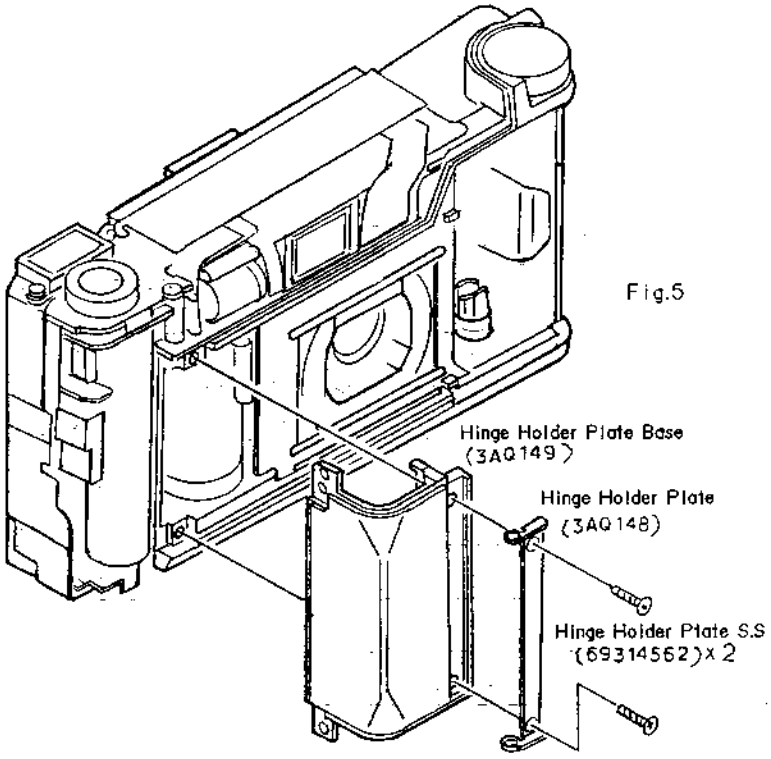



Fig.5

Note: a)In removeing the Hinge Holder Plate Base,remember that the Hinge Holder Plate Base Plate Base and the camera body are sealed in two positions.
b)When installing the Hinge Holder Plate Base,stick the Hinge Light-proof Cloth (2) (3AQ180) and Hinge Light-proof Cloth (1) (3AQ181) before applying sealeder (black). In doing so,make sure that there is no unseemly protrusion inside the spool chamber.

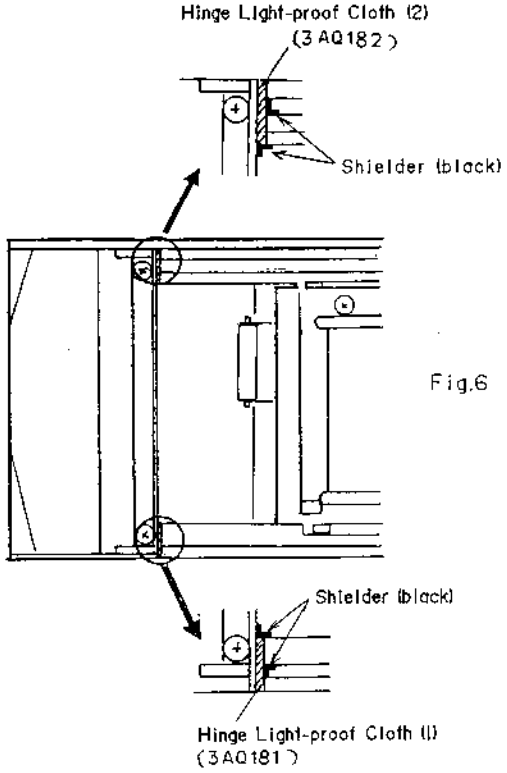



Fig.6

## B-2 Disassembly of Main FPC Ass'y

### B-2-1 Removal of Main FPC Ass'y

1)Remove the Release Plate Spring (3AQ315) by taking out the Release Plate Spring Setscrew (69216076).

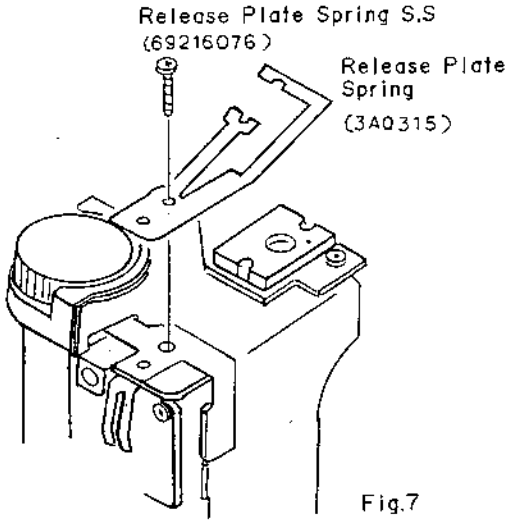



Fig.7

2)Take out the LCD Retainer Setscrew (69217066).
Remove the LCD Retainer (3AQ335) by disengaging the catch.
3)Remove the C-LCD (3AQ531),LCD Spacer (3AQ336) and LCD Connector (3AQ532).
4)Remove the Sheet (3AQ538).

Notes: a)The Flash sheet is held between the Exposure Compensation P.C. Board and the Flash Holder Base.
b)In assembling, never forget to install the Flash Sheet Otherwise, there may be cases of flashing failure due to a phenomenon of discharge from reflector to body.

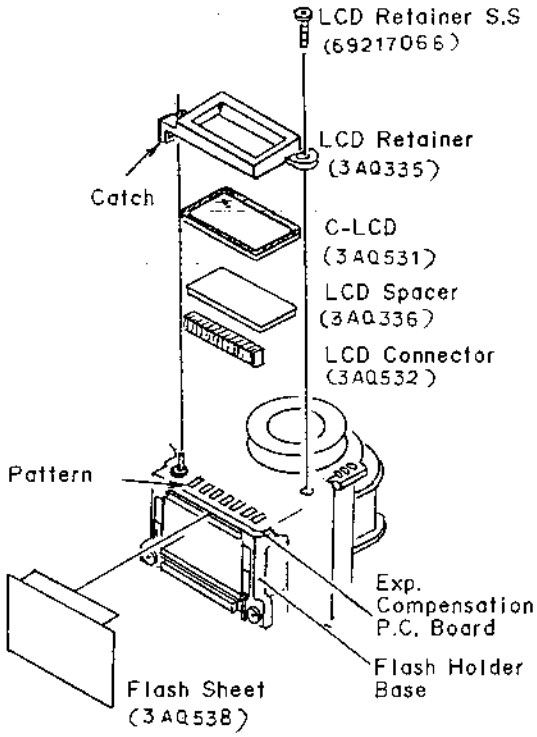



Fig.8

[Notes on installation of LCD]
a)Before installing the C-LCD,wipe clean the pattern area of the main FPC,the LCD connector and the connector of the C-LCD with ether alcohol.
b)When installing the LCD Retainer,make sure that the catch of the LCD Retainer is engaged with the Exposure Compensetion P.C.Board.

[Discharge of Flash Capacitor]
Discharge the flash capacitor before removing the Main FPC Ass'y.
The flash capacitor,which keeps a high voltage, is dangerous. Therefore remove the charge,using some discharge jig.

(1)Loosen,or take out,the LCD Retainer Setscrew.
(2)Remove the Flash Sheet.
(3)Take out the two Flash Holder Setscrews.
(4)Move the Flash Holder in the direction of the arrow Ⓐ.
(5)Connect the terminal of the discharge jig to the anode terminal of the Xe tube.
(6)Connect the terminal of the discharge jig to the GND of the Flash P.C.Board and discharge the Flash Capacitor.

**Note: a)In moving the Flash Holder to the front,take care so that the Xe tube may not get caught by the Main FPC.**

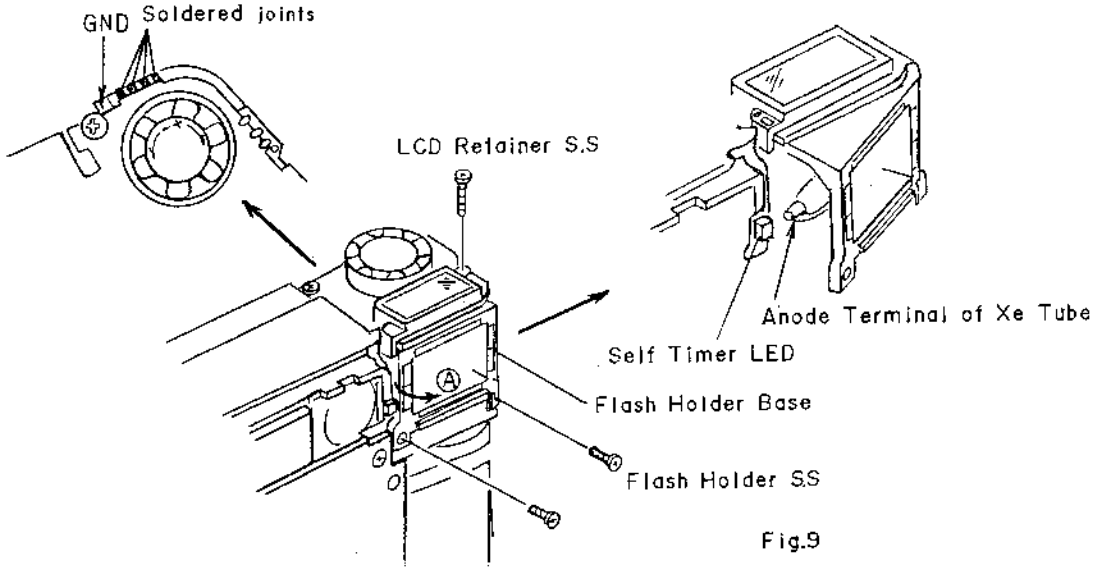


Fig.9

[Notes on Unsoldering and Soldering]
a)If excessive heat from the soldering iron may render the FPC pattern useless by peeling the flexible cover lay. Therefore,do not apply a hot iron for more than a few secondes.
b)In soldering the lead wires and soldered joints at the top and bottom of the camera body,minimize the solder height. As there is little clearnace between the camera body and Top and Bottom Cover,a high solder is peessed by the Top and Bottom Cover and can cause shorting.
c)Because of the narrow spaces between the solder joints,therefore,carefully examine all solder joints,particularly those that have been made during repair.

5)Peel the FPC from Self Timer LED of the Main FPC. (See Fig.9)

**Note: The Self Timer LED of the Main FPC is fixed to the AF Holder with light metering adhesive tape.**

6)Unsolder the four soldered joints of the Main FPC and Flash P.C.Board.

7)Unsolder the 7 Lead Wires:

- ○Black Lead Wire (from Flash P.C.Board)
- ○Red Lead Wire (from ⊕ battery contact)
- ○Red Lead Wire (from Flash P.C.Board)
- ○Red Lead Wire (from Pin 14 of IC-206)
- ○Blue Lead Wire (from Wind Moter)
- ○Purple Lead Wire (from Wind Moter)
- ○Yellow Lead Wire (from Shutter FPC)

*It is not necessary to unsolder the Blue and Purple Lead Wires (from IC-206).

8)Unsolder the Chip Ceramic Capacitor (5ECQB1E104B**41).

**Note: Remember that use of the Chip Ceramic Capacitor and the red, purple and blue Lead Wires from IC-206 will be stopped due to a modification in the Main FPC during production.**

9)Unsolder the three soldered joints of the Cam Switch FPC and the Main FPC.

10)Unsolder the four soldered joints of the Sub FPC and Main FPC.

11)Unsolder the 9 soldered joints of the Sub FPC and Main FPC.

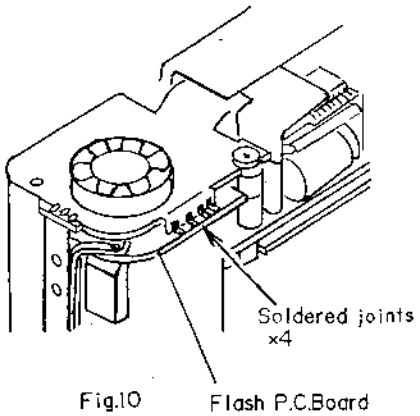
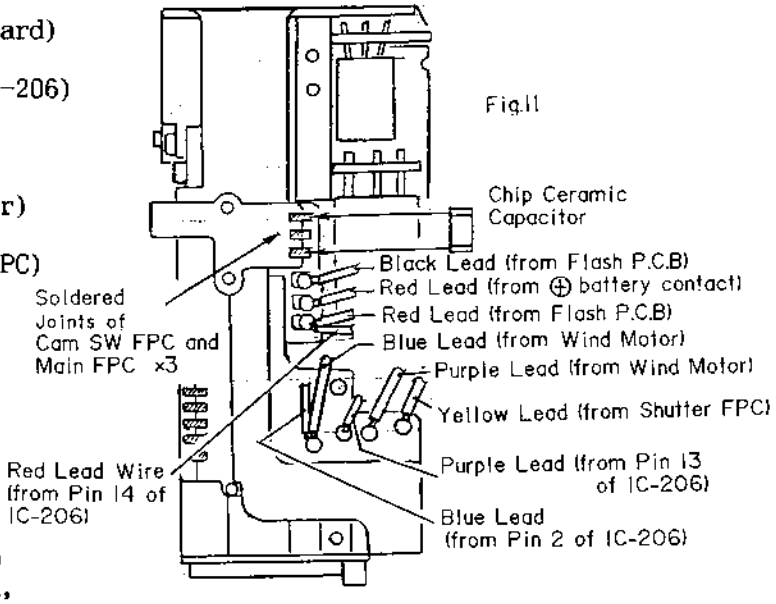


Fig.10

[Right side of camera body]


Chip Ceramic Capacitor
Black Lead (from Flash P.C.B)
Red Lead (from ⊕ battery contact)
Red Lead (from Flash P.C.B)
Blue Lead (from Wind Motor)
Purple Lead (from Wind Motor)
Yellow Lead (from Shutter FPC)
Purple Lead (from Pin 13 of IC-206)
Blue Lead (from Pin 2 of IC-206)
Soldered Joints of Cam SW FPC and Main FPC ×3
Red Lead Wire (from Pin 14 of IC-206)
Fig.11

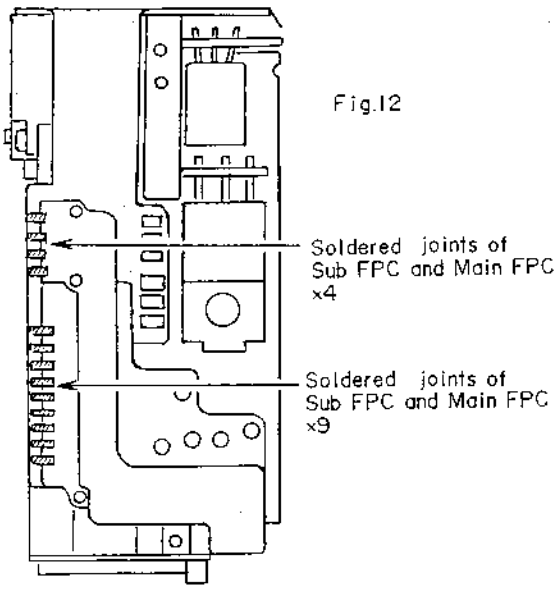


Fig.12

12)Take off the Sub FPC in the divection of the arrow.

**Note: a)The Sub FPC is fixed to the Insulator (Lower) with double stick tape.**

13)Remove the Insulator (Lower) (3AQ66010) by taking out the Sub FPC Setscrew (61911626).
14)Unsolder the 16 soldered joints of the Main FPC and Sub FPC.
15)Unsolder the 12 soldered joints of the Main FPC and DX FPC.

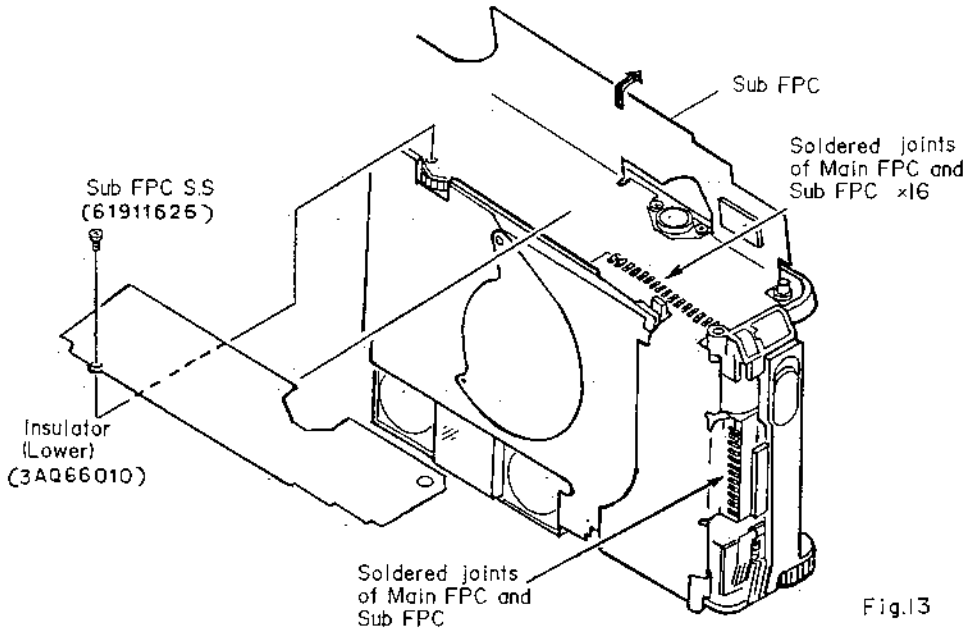

Sub FPC
Soldered joints of Main FPC and Sub FPC ×16
Sub FPC S.S (61911626)
Insulator (Lower) (3AQ66010)
Soldered joints of Main FPC and Sub FPC

Fig.13

16)Take off the Main FPC in the direction of the arrow.
17)Remove the Insurator (Upper) (3AQ81201).

**Note: a)The Main FPC and Insulator (Upper) are fixed to each other with double stick tape.**

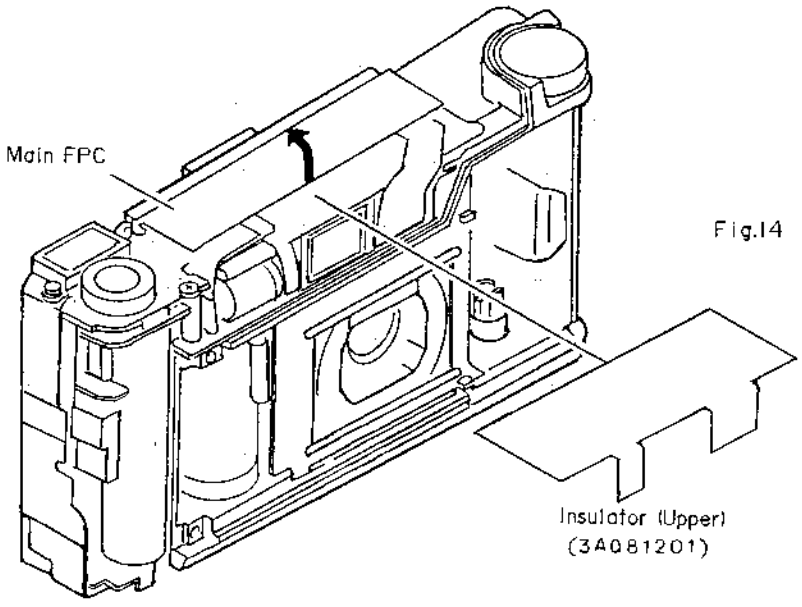



Fig.14

18)Unsolder the 12 soldered joints of the LED FPC and the Main FPC.
19)Unsolder the Shielded Wire and white Lead Wire.
20)Unsolder the black Lead wire (from minus lug plate) and blue Lead Wire (from C204).
21)Unsolder the 9 soldered connectios of the Shutter FPC and Main FPC.

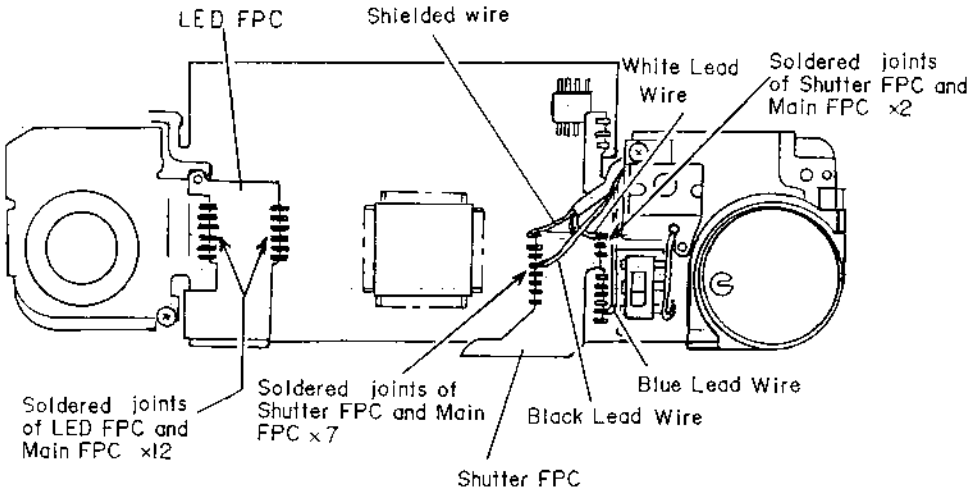

LED FPC
Shielded wire
White Lead Wire
Soldered joints of Shutter FPC and Main FPC ×2
Soldered joints of LED FPC and Main FPC ×12
Soldered joints of Shutter FPC and Main FPC ×7
Black Lead Wire
Blue Lead Wire
Shutter FPC

Fig.15

22)Unsolder the black Lead Wire (from Capacitor) and green Lead Wire (from AF LED P.C.Board)
23)Unsolder the 6 soldered joints of the AF FPC and Main FPC.
24)Unsolder the 3 soldered joints of the PI AF FPC and Main FPC.
25)Bend the Main FPC in the direction of arrow,and unsolder the black and gray Lead Wires (from Lock SW P.C.Board).
26)Unsolder the 4 soldered joints of the Operation FPC and Main FPC.

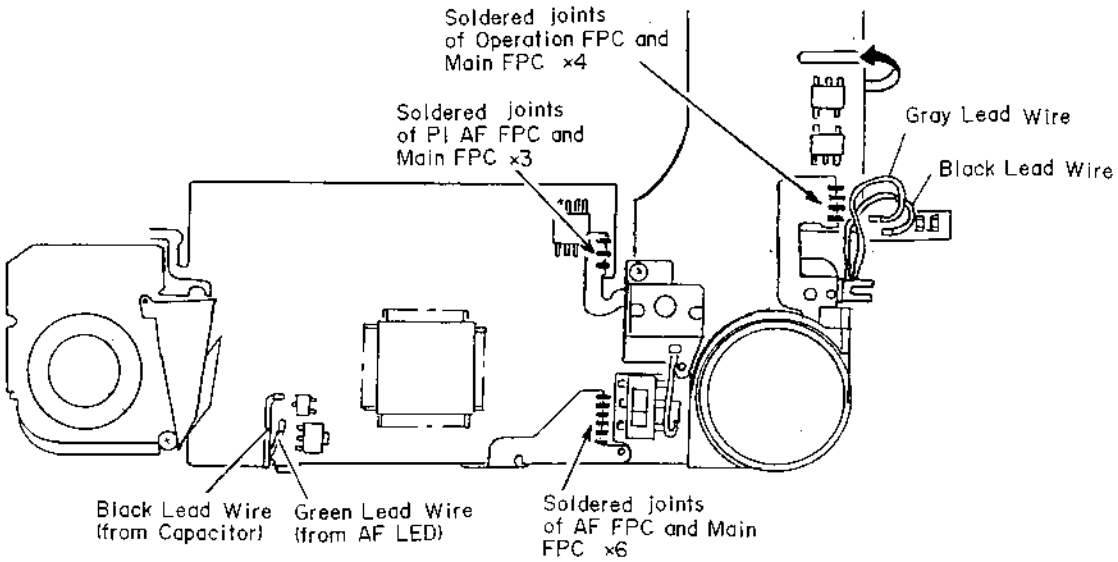

Soldered joints of Operation FPC and Main FPC ×4
Soldered joints of PI AF FPC and Main FPC ×3
Gray Lead Wire
Black Lead Wire
Black Lead Wire (from Capacitor)
Green Lead Wire (from AF LED)
Soldered joints of AF FPC and Main FPC ×6

Fig.16

27)Take out the Main FPC Setscrew (69213576).
28)Remove the Main FPC Ass'y (3AQA0600) by taking out the Release Switch Setscrew (69114076).

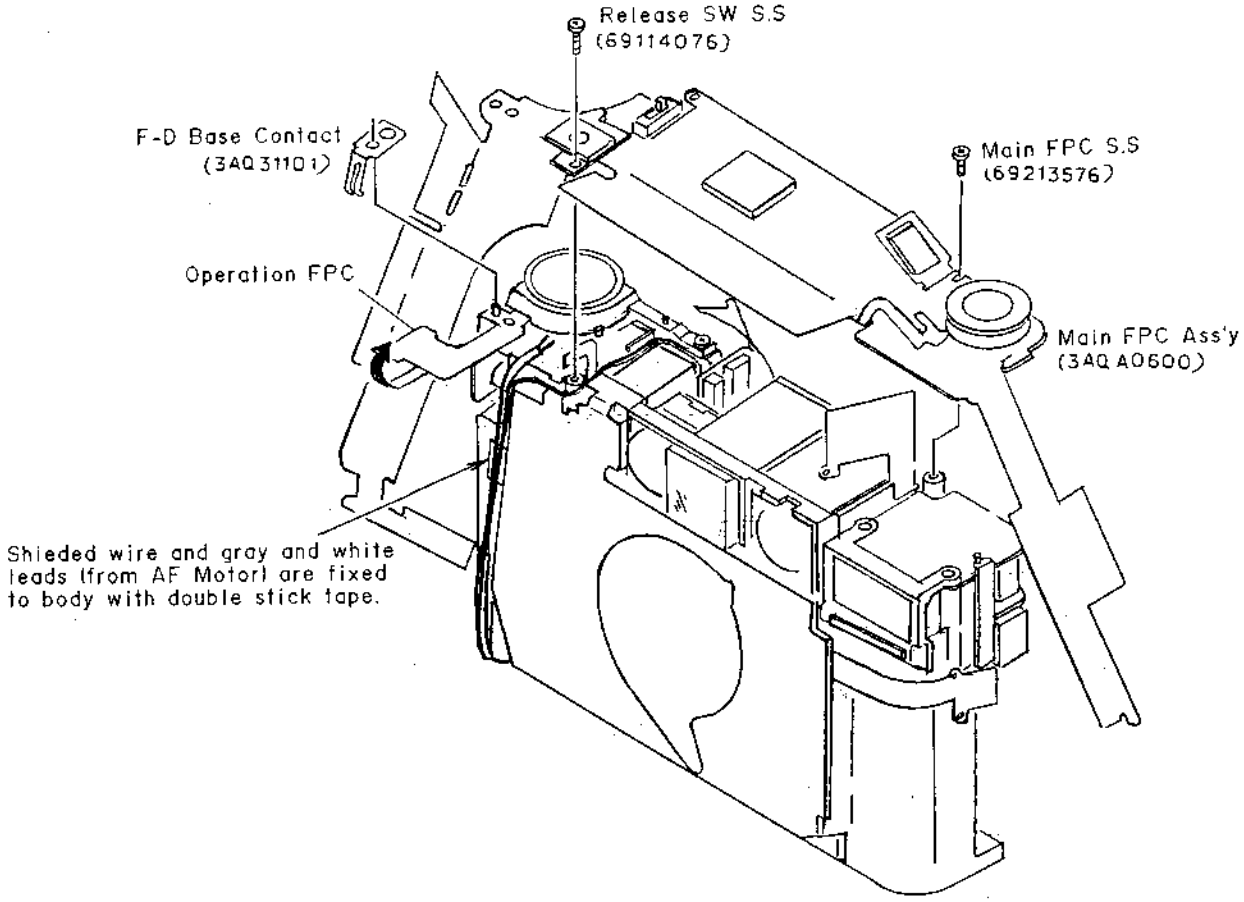



Fig.17

29)Remove the F-D Base contact (3AQ31101) by raising the Operation FPC.

[Forming of Leads]
a)Forming the Shielded Wire and white and gray Lead Wires from the AF Motor by fixing then to body with double stick tape.

## B-3 Disassembly of Sub FPC Ass'y

### B-3-1 Removal of Sub FPC Ass'y

1)Unsolder the three soldered joints of the PI-WI FPC and Sub FPC.
2)Unsolder the 6 Lead Wires:

Yellow Lead Wire (from D.B.Contact)

Brown Lead Wire (from D.B.Contact)

Orange Lead Wire (from Capacitor (100μF)⊕)

Blue Lead Wire (from Capacitor (100μF)⊖)

Black Lead Wire (from Capacitor (470μF)⊖)

Red Lead Wire (from Capacitor (470μF)⊕)

3)Unsolder the two Coil Lead Wires (from Coil).

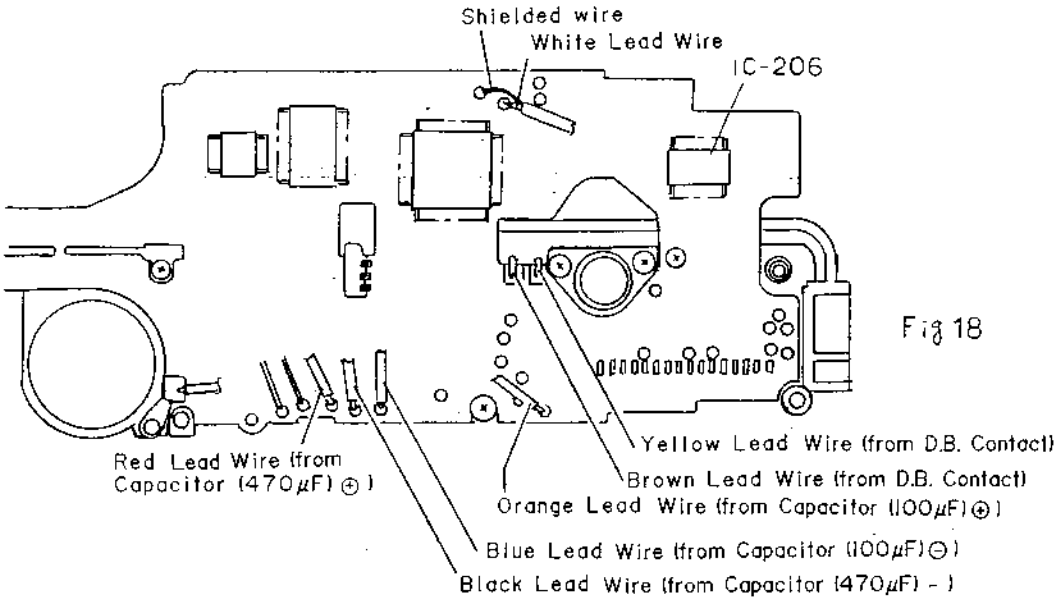

Shielded wire
White Lead Wire
IC-206
Red Lead Wire (from Capacitor (470μF)⊕)
Yellow Lead Wire (from D.B. Contact)
Brown Lead Wire (from D.B. Contact)
Orange Lead Wire (from Capacitor (100μF)⊕)
Blue Lead Wire (from Capacitor (100μF)⊖)
Black Lead Wire (from Capacitor (470μF) - )

Fig 18

4)Unsolder the gray and white Lead Wires (from AF Motor) soldered on IC-206 terminals.

**Notes: a)It is not necessary to unsolder the red,purpule and blue Lead Wires connected to the IC-206 terminals.**
**b)The purple and blue Lead Wires will be disused upon the modification of the Main FPC.**

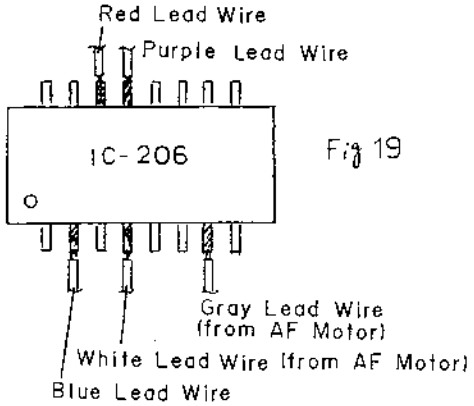



Fig 19

5)Remove the Battery Cap Holder (3AQ12600) by taking out the Battery Cap Holder Setscrew (69114072).
6)Remove the Sub FPC Ass'y (3AQA0700) by taking out the Sub FPC Setscrew (61911626).

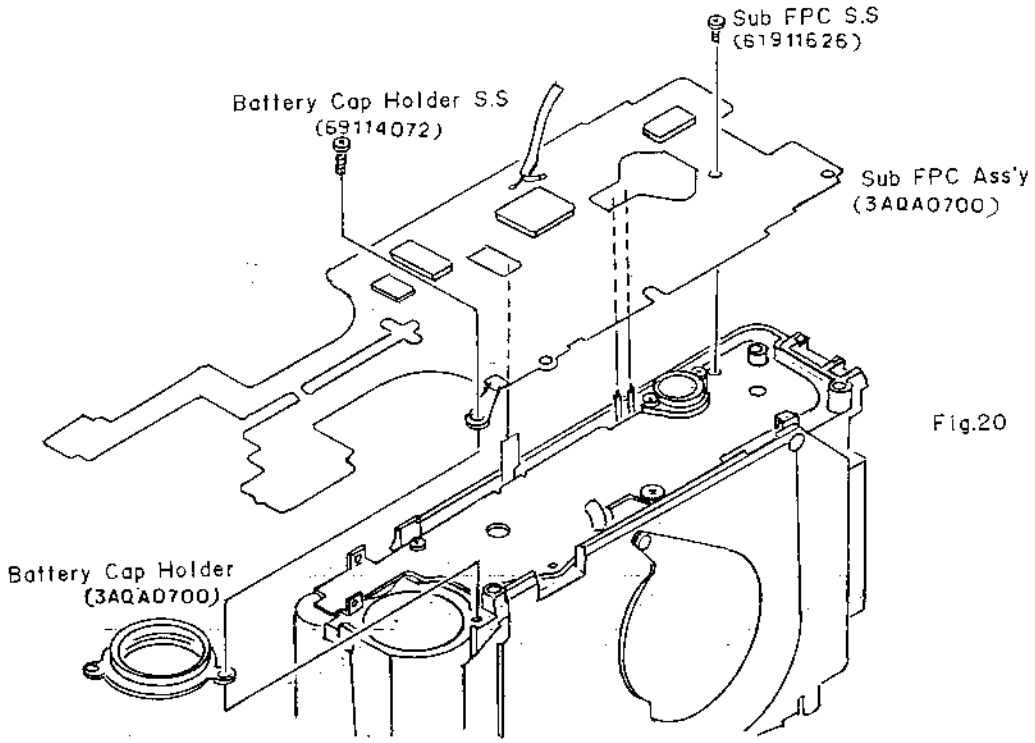



Fig.20

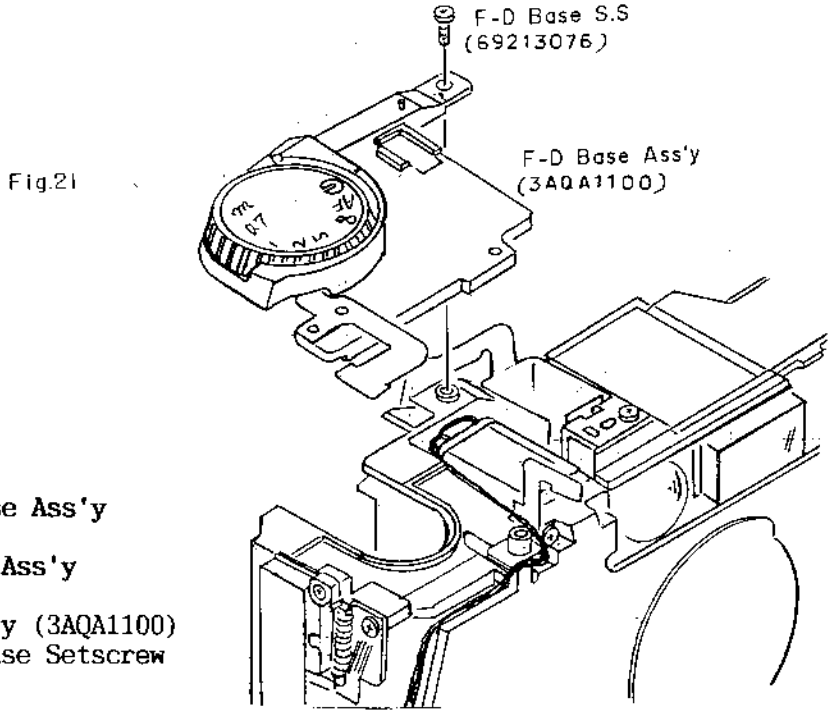



Fig.21

**B-4 Disassembly of F-D Base Ass'y**

**B-4-1 Removal of F-D Base Ass'y**

1)Remove the F-D Base Ass'y (3AQA1100) by taking out the F-D Base Setscrew (69213076).

## B-5 Disassembly of Flash Unit

### B-5-1 Removal of Flash Unit

1)Remove the Flash Emitter by taking out the Flash Unit Setscrews (69114076) X 2.
2)Remove the Flash A P.C.Board by taking out the Flash Unit Setscrew (69114076).

3)Remove the Flash B P.C.Board by taking out the Flash Unit Setscrew (69114076),and then remove the Flash Unit (3AQ53500).

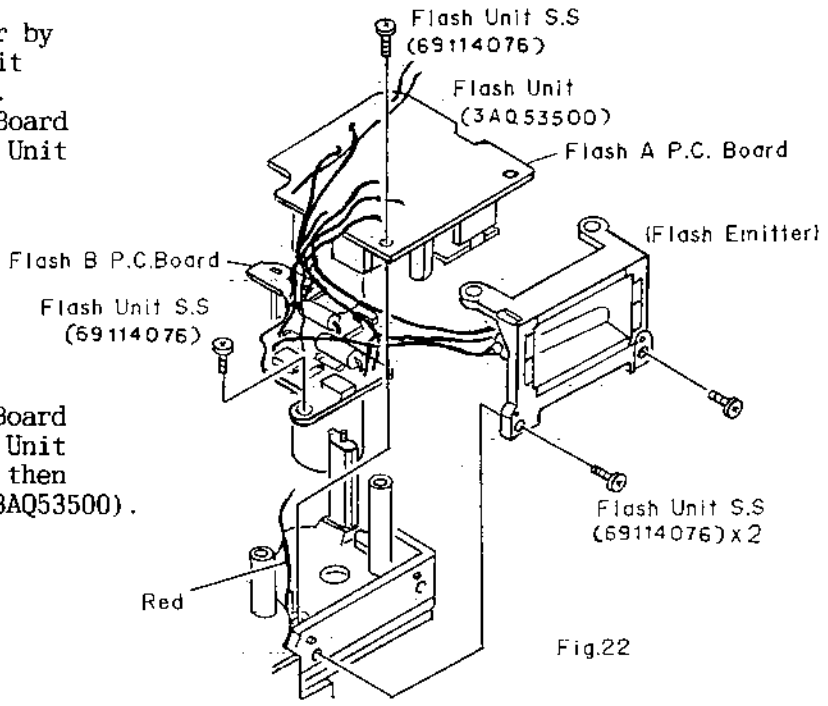


Fig.22

## B-6 Disassembly of Viewfinder Unit Ass'y

### B-6-1 Removal of Viewfinder Unit Ass'y

1)Remove the Viewfinder Unit Ass'y (3AQA2300)by taking out the Viewfinder Unit Setscrews (69212586) X 2.

Note: a)Never disassemble the Viewfinder Ass'y for the position adjustments of parallax,AF LED and SPD reqire special devices.

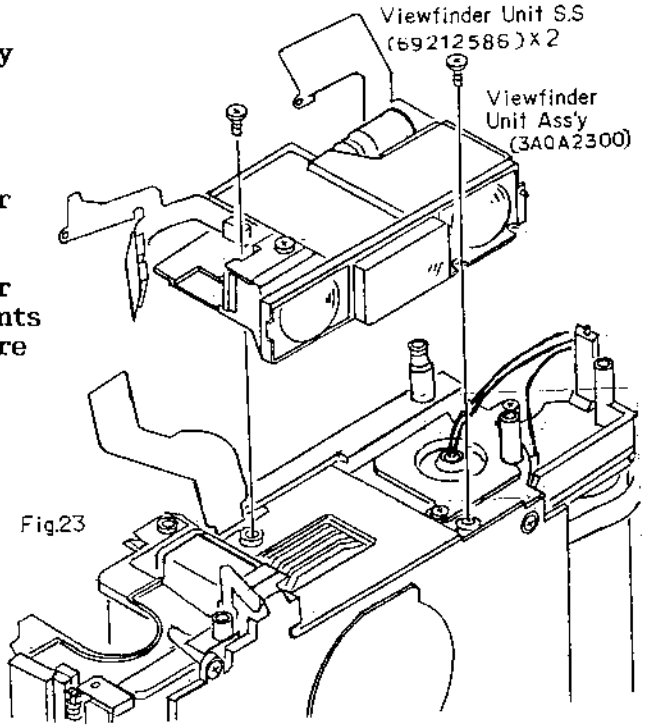


Fig.23

## B-7 Disassembly of AF Front Plate Ass'y

### B-7-1 Removal of AF Front Plate Ass'y

1)Remove the AF Front Plate Ass'y (3AQA1400) by taking out the AF Front Plate Setscrews (69112566) X 2, (69114076) X 2.

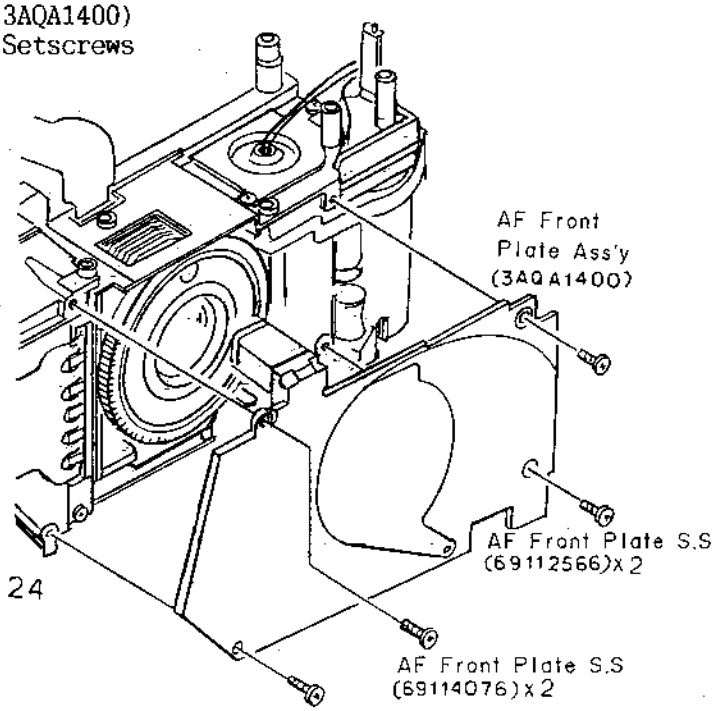



Fig 24

## B-8 Disassembly of Winding Mechanism

### B-8-1 Removal of MM Base Plate (Lower) Ass'y

1)Remove the MM Base Plate (Lower) Ass'y (3AQA1200) by taking out the MM Base Plate (Lower) Setscrews (69113076) X 2, (66001023).

**[Notes on installation of MM Base Plate (Lower) Ass'y]**
In installing the MM Base Plate (Lower) Ass'y, take case so that the rising part of the MM Gear Link Plate (Epicylic Gear Lever) may not get caught.

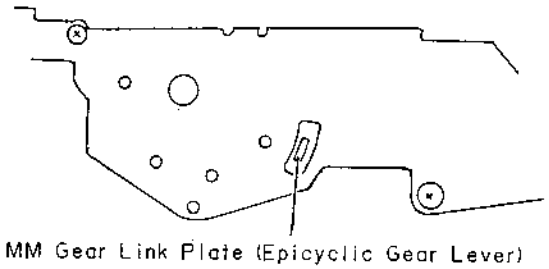



Fig 26

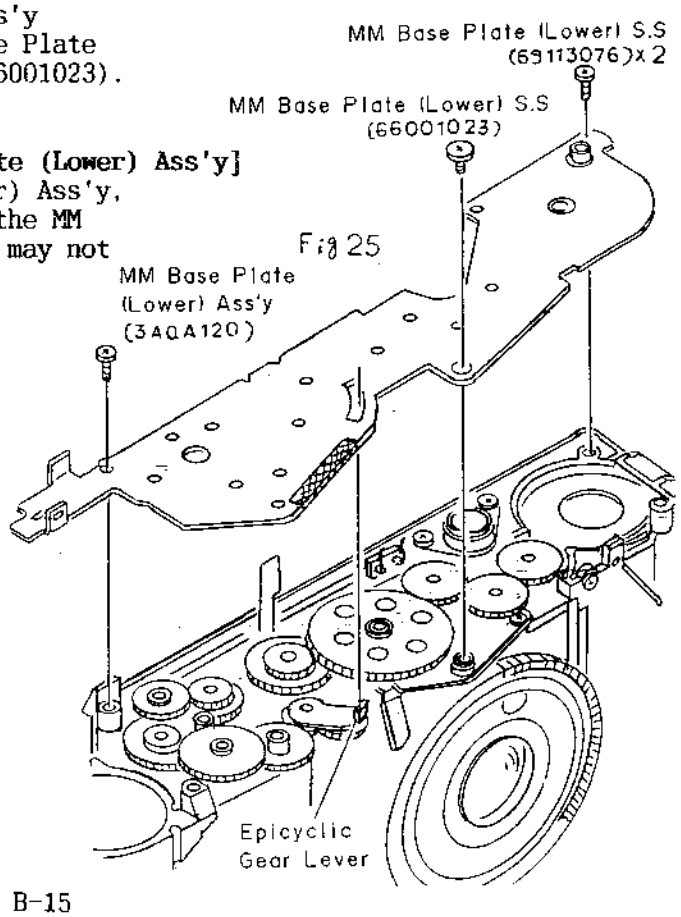



Fig 25

B-8-2 Removal of Winding Gears

1)Remove the MM Gears(1) to (11) in the order of numbers.

Note: Take cave not to damage the MM Gear (1) (3AQ60200) which is particularly of soft material.Damaged MM Gear (1) may produce noise during winding.

2)Remove the Tripod Holder (3AQ14500) by taking out the Tripod Holder Setscrews (69224566) X 2.

Note: a)Without the Tripod Holder (3AQ14500) removed,the Lens Barrel Ass'y (3AQA1800) will not come off.

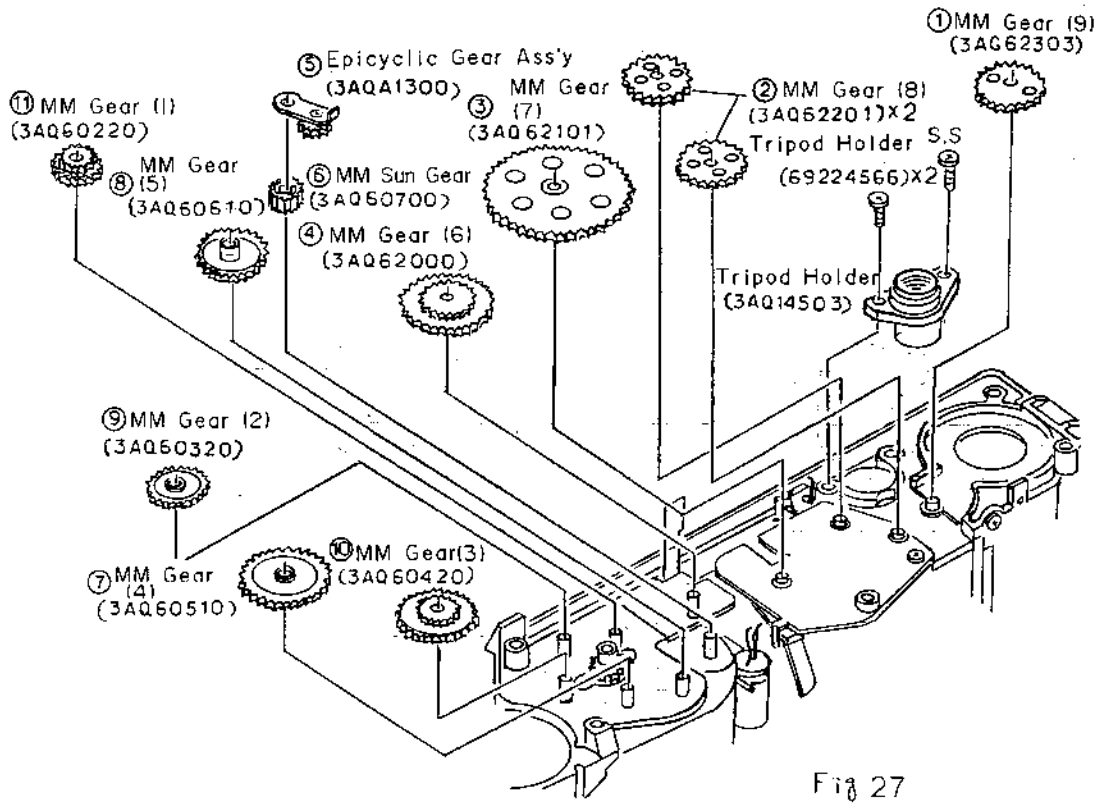

①MM Gear (9) (3AQ62303)
⑤Epicyclic Gear Ass'y (3AQA1300)
③ MM Gear (7) (3AQ62101)
②MM Gear (8) (3AQ62201)X2
⑪MM Gear (1) (3AQ60220)
Tripod Holder S.S (69224566)X2
⑧ MM Gear (5) (3AQ60610)
⑤MM Sun Gear (3AQ60700)
④MM Gear (6) (3AQ62000)
Tripod Holder (3AQ14503)
⑨MM Gear (2) (3AQ60320)
⑩MM Gear(3) (3AQ60420)
⑦MM Gear (4) (3AQ60510)

Fig 27

[Notes on installation of MM Gears]
a)Do not mistake the top and bottom sides of the MM Gear (7) (3AQ62101). (See Fig.28)
b)Do not mistake the MM Gear (8) (3AQ62201) (black) and MM Gear (9) (3AQ62303) (white) for each other. Confusion may result in heavy rewinding
c)Apply Grease I-40 to the bearings of the Gears. (See Fig.29)

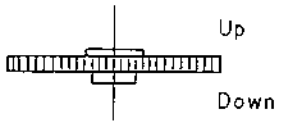



Fig 28

[Application of Grease]

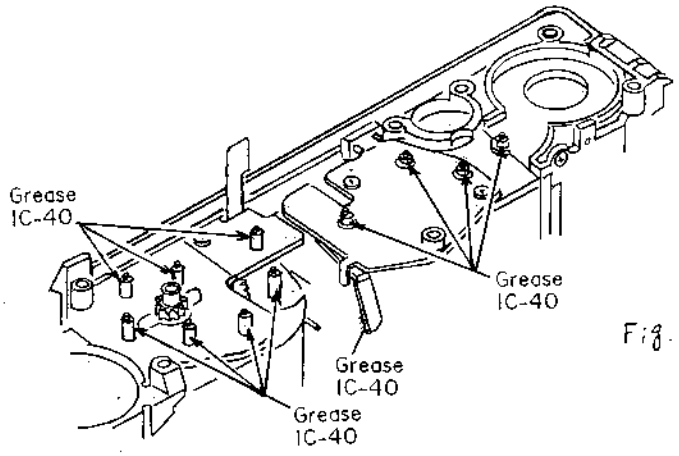



Fig.29

3)Remove the MM Base Plate (Upper) Ass'y (3AQA160) by taking out the MM Base Plate (Upper) Setscrews (69112566)) X 2.

4)Remove the MM Motor Ass'y (3AQA1500) and Spool Gear (39661010) by taking out the MM Motor Ass'y Setscrews (69113576) X 3.

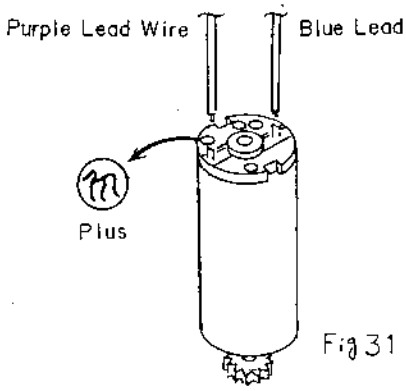



Fig 31

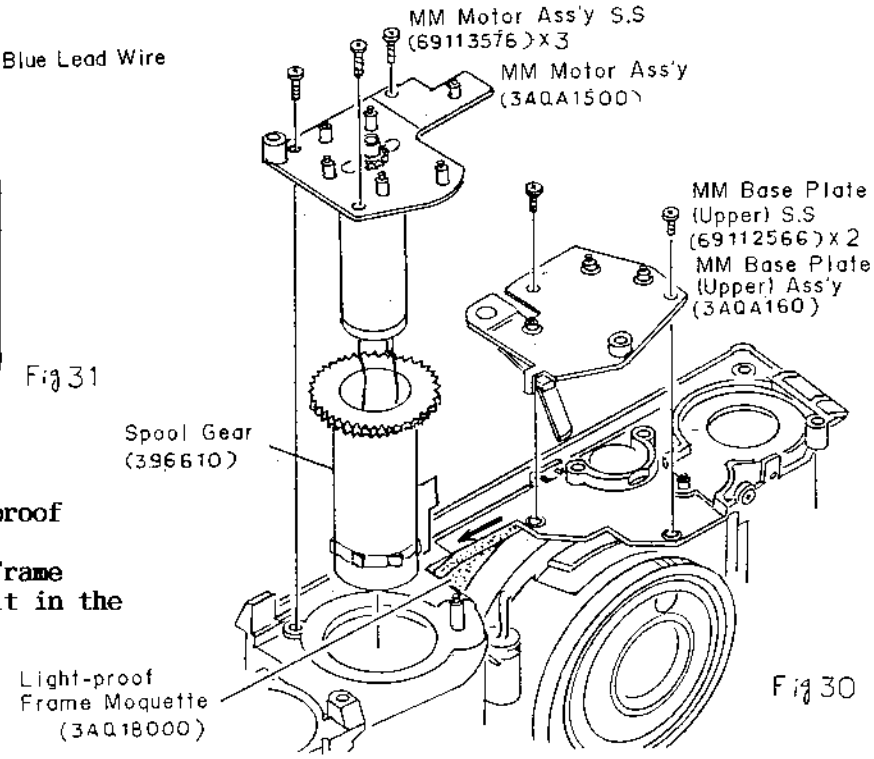



Fig 30

**[Note on Sticking Light-proof Frame Moquette]**

**a)Stick the Light-proof Frame Moquette after moving it in the direction of the arrow.**

## B-9 Disassembly of Lens Barrel Ass'y

### B-9-1 Removal of Lens Barrel Ass'y

1)Remove the Cam Switch Ass'y (3AQA1700) by taking out the Cam Switch Setscrew (69214576).
2)Remove the Aperture Ass'y (3AQA1400) by taking out the Aperture Setscrews (61812528) x 4.
3)Remove the Lens Barrel Ass'y (3AQA1800) from the front.

Notes: a)Removal or installation of the Cam Switch Ass'y must be performed with great care so as not to deform it.
b)The Light-proof Frame Moquette (3AQ18000) is stuck to the body (below) and the Lens Barrel Ass'y. Be sure to peel off the Light-proof Frame Moquette from the body without tearing it before removing the Lens Barrel Ass'y. (See Fig.30)

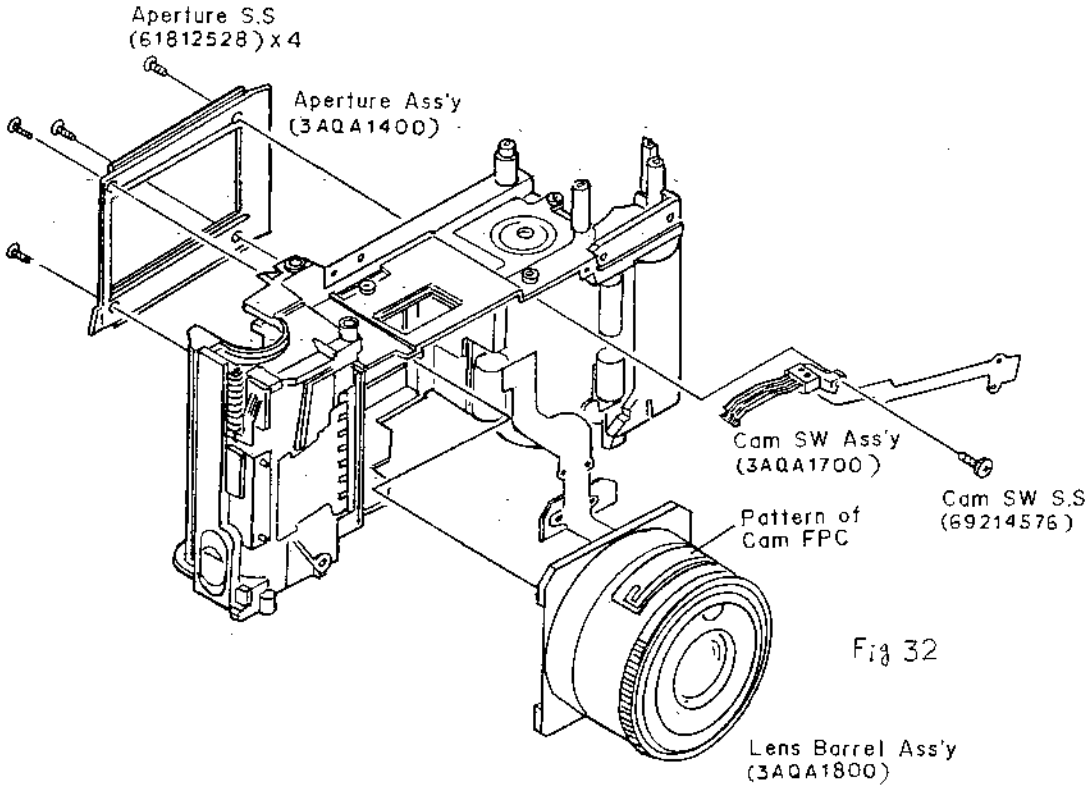



Fig 32

[Checking after Installation of Cam Switch Ass'y]
Attach the contact pieces to the Cam FPC and Cam Switch Ass'y after wiping then with ether alcohol.After installing the Cam Switch Ass'y, turn the Lens Barrel Ass'y and check to make sure that the contact piece of the Cam Switch Ass'y is in contact with the pattern of the Cam FPC.

## B-10 Disassembly of DX Case Ass'y

### B-10-1 Removal of DX Case Ass'y

1)Remove the DX Case Ass'y (3AQA2200) by taking out the DX Case Setscrew (69113076) X 2.

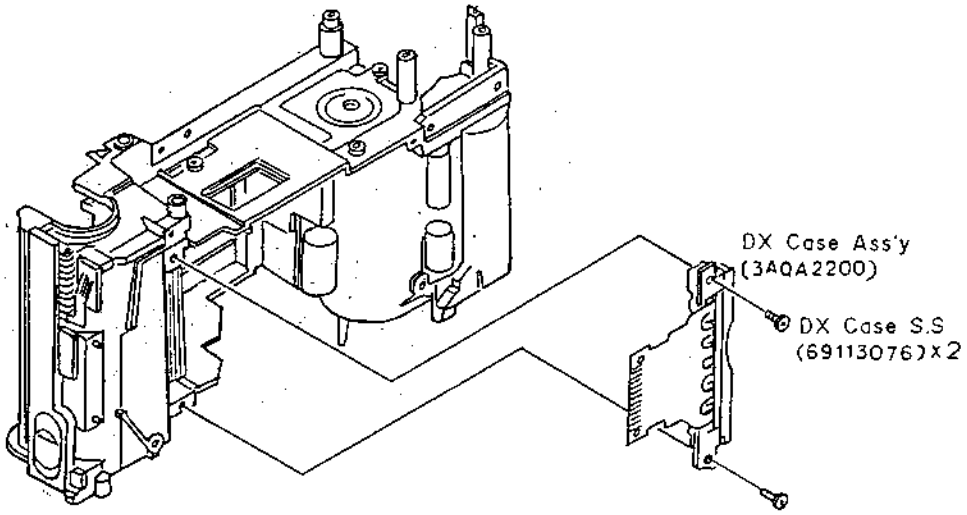



Fig 33

## B-11 Disassembly of PI-WI Ass'y

### B-11-1 Removal of PI-WI Ass'y

1)Remove the PI-WI Ass'y (3AQA2000) by taking out the PI-WI Holder (3AQ65200).

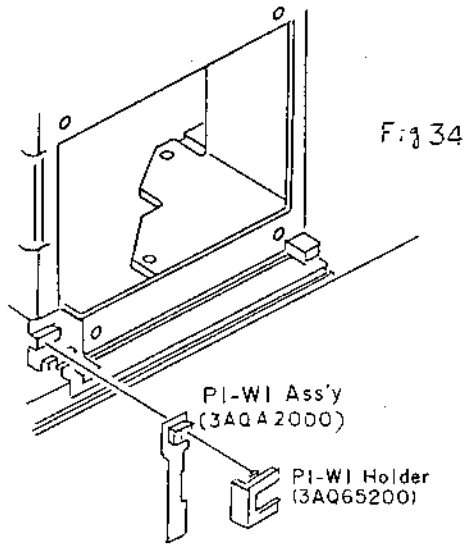



Fig 34

B-12 Disassembly of Lock Plate Cover Ass'y

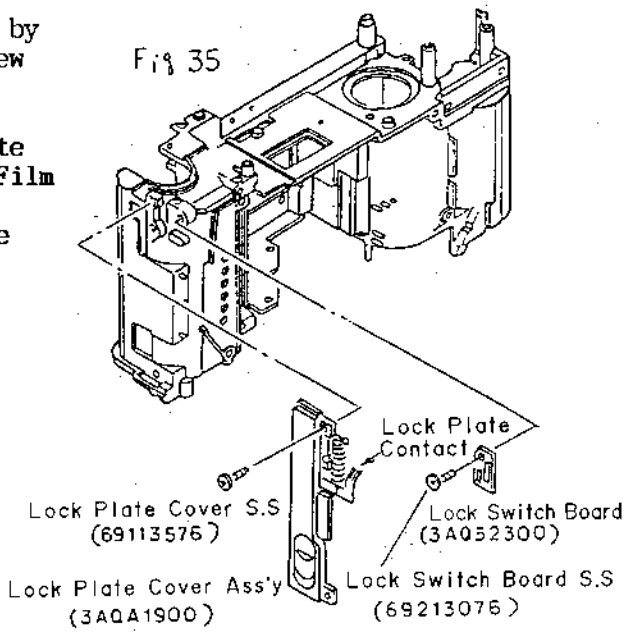
B-12-1 Removal of Lock Plate Cover Ass'y

1)Remove the Lock Plate Cover Ass'y (3AQA1900) by taking out the Lock Plate Cover Setscrew (69113576).

2)Remove the Lock Switch Board (3AQ52300) by taking out the Lock Switch Board Setscrew (69213076).

Note: a)During repair,handle the Lock Plate Contact with great case. Initial Film advancement will not occur if the contact pressure of the Lock Plate Contact is not adequate.

Fig 35


Lock Plate Contact
Lock Plate Cover S.S (69113576)
Lock Switch Board (3AQ52300)
Lock Plate Cover Ass'y (3AQA1900)
Lock Switch Board S.S (69213076)

[Notes on Soldering Leads to Lock Switch Board]

a)Do not use too much solder when soldering the gray Lead Wire to the Lock Switch Board. Blank shots does not operate if there is short with the Pattern Ⓐ.

b)In soldering the black Lead Wire to the Lock Switch Board, take care so that the solder may not flow into the Pattern Ⓑ. Solderentering the Pattern Ⓑ can obstacle the operation of the Lock Plate Contact. (See Fig.35)

c)When soldering the black and gray Lead Wires, do not allow it to thread. Threaded solder has greater chances of touching the Front Cover, therefore,pressing the Front Cover strongly can cause blank shots advancement. (See Fig.36)

d)In the process of production, the soldering position of the Lock Switch Board was changed to the back side. (See Fig.37)

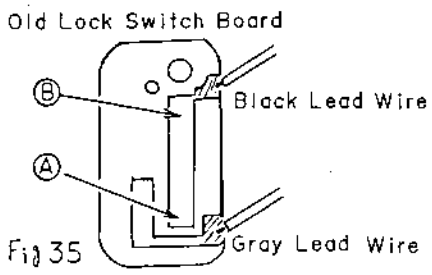



Fig 35

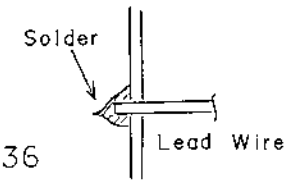



Fig 36

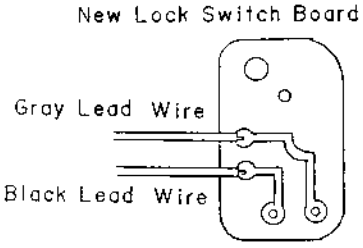



Fig 37

# C. REASSEMBLY AND ADJUSTMENT PROCEDURE

## C-1 Reassembly of Assembly Parts

### C-1-1 Reassembly of AF Front Plate Ass'y

1) Apply Grease H-26 to the five bearings of the AF Gear Base Plate Ass'y (3AQA2100).
2) Install the AF Gears in the order of ① to ⑤.

**Note: In installing the Gears, take care not to damage the teeth.**

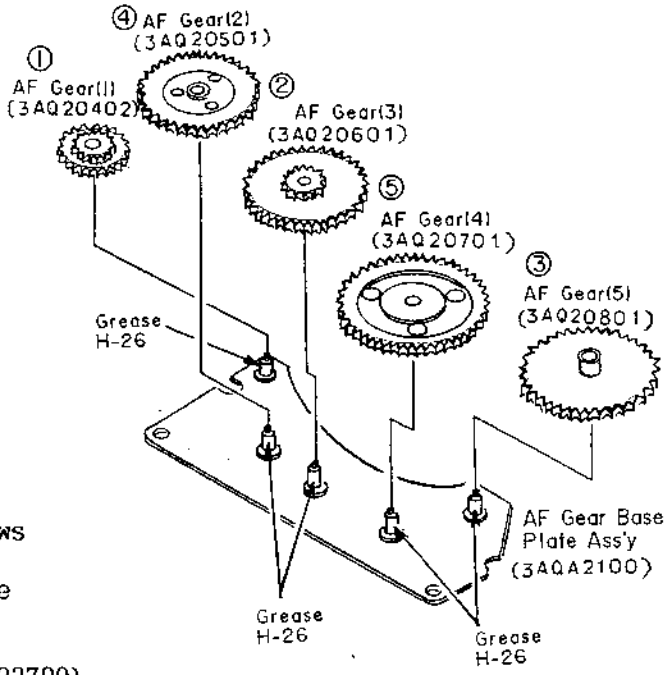



Fig 38

3) Install the AF Gear Base Plate Ass'y with the AF Gers set on the AF Front Plate(3AQ20100).
4) Tighten the AF Gear Base Plate Setscrews (69313566) X 2.
5) Apply Grease I-40 to the bearing of the Barrier Ass'y (3AQA4400), and fit it in the AF Plate.
6) Install the Barrier Driving Plate (3AQ22700) along the cut of barrier drive shaft.
7) Place the Barrier Close Spring (3AQ22910) and secure it by fighting the Barrier Fixing Screw (3AQ22601).

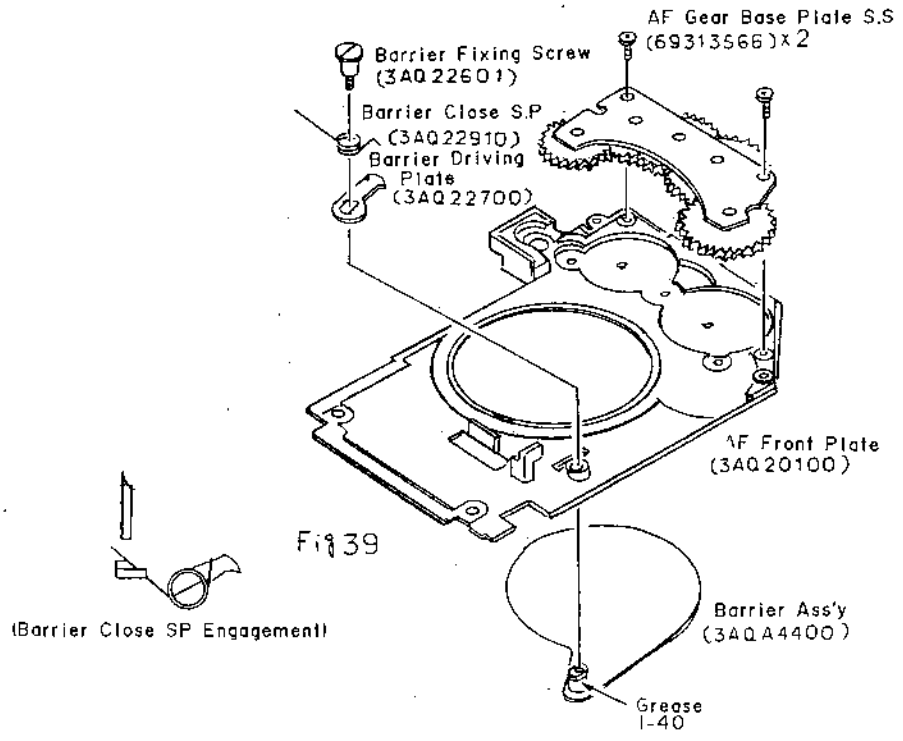

AF Gear Base Plate S.S (69313566) x 2
Barrier Fixing Screw (3AQ22601)
Barrier Close S.P (3AQ22910)
Barrier Driving Plate (3AQ22700)
AF Front Plate (3AQ20100)
Barrier Ass'y (3AQA4400)
Grease I-40
(Barrier Close SP Engagement)

Fig 39

8) Insert the PI AF Ass'y (3AQA4300) in the AF Motor Ass'y (3AQA4500).
9) Install the AF Motor Ass'y on the AF Front Plate,and secure it by tightening the AF Motor Ass'y Setscrews (69115066) X 2, (69117066).

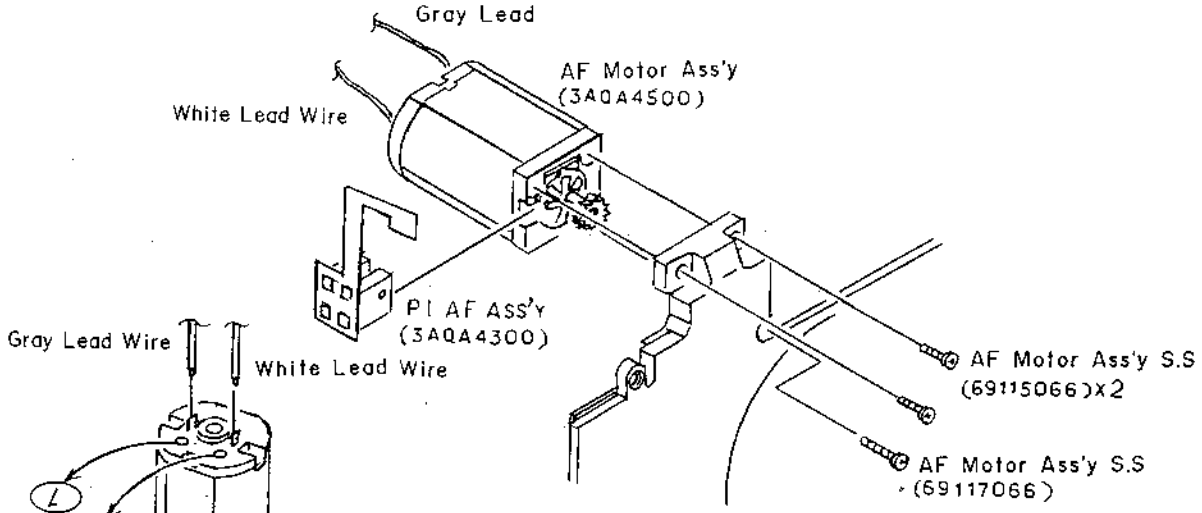



Fig 40

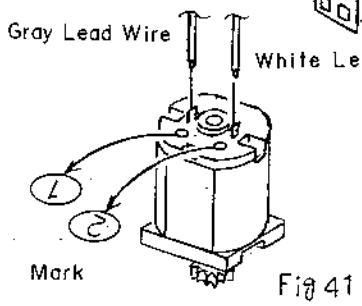



Fig 41

**[Operation Check and Adjustment of Barrier Ass'y]**

Check to make sure that the Barrier is in parallel with the surface Ⓐ of the AF Front Plate as shown below.
If it is found inclined,correct it into parallel position by bending the portion Ⓑ of the Barrier with a finger.

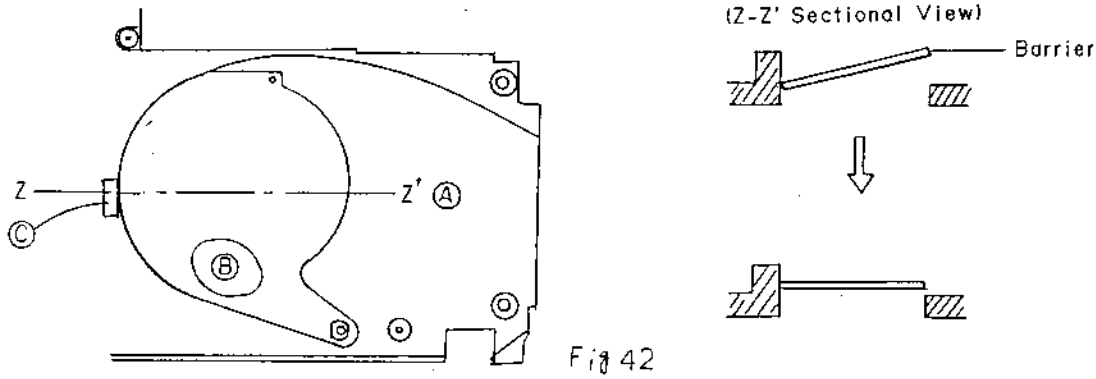



Fig 42

Notes: a) The Barrier,when closed,must not extend beyond the portion Ⓒ of the AF Front Plate.
b) Do not bend the Barrier too far.

C-1-2 Reassembly of Lens Barrel Ass'y

1)Fit the Lens Cell Base Ass'y (3AQA5300) onto the Shutter (3AQ25701),and secure it by tightening the Shutter Setscrews (63903326) X 3.

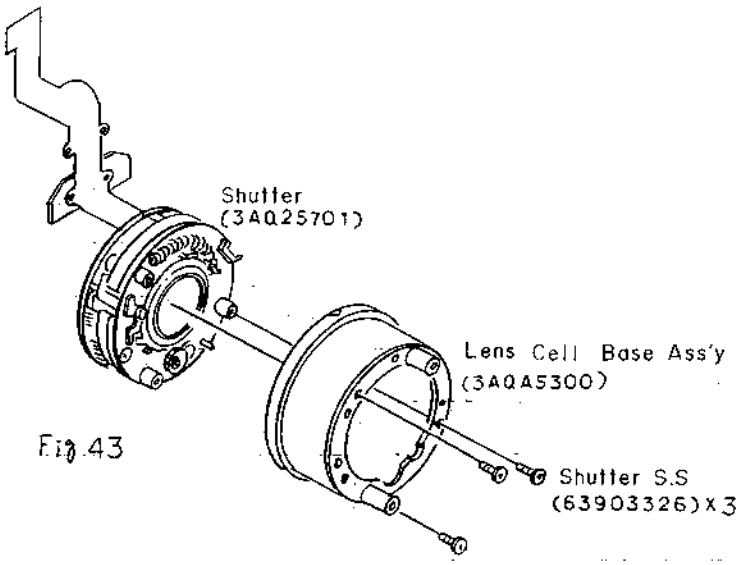



Fig.43

**Note: a)Handle the shutter,particularly the blades and spring,with great care.**

2)Read the washer value entered on the Lens Unit in Lens F.B. (Flange Back) Adjustment,select washers for F.B. adjustment,and place four washers on the Lens Cell Base Ass'y.
Then install the Lens Unit (3AQ26300) on top of then.

*At the factory,the Lens F.B.of each Lens Unit is measured and the F.B. adjustment washer value is penciled on the surface Ⓐ of the Lens Unit. The value entered is a decimal frection only as shown below.

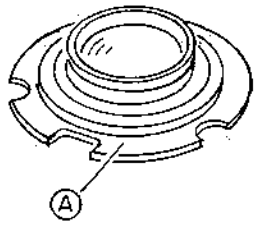



Fig.44

| | | |
|---|---|---|
| t0.2 → 2 | t0.5 → 5 | t0.8 → 8 |
| t0.3 → 3 | t0.6 → 6 | |
| t0.4 → 4 | t0.7 → 7 | |

3)Secure the F.B. Adjusting Washers by tightering the two corresponding Lens Unit Setscrews.
4)Place the SPD Board (3AQ52802) and secure it by tightening the two SPD Board Setscrew corresponding to the F.B. Adjusting Washers.

**Note: a)The Setscrews,which are not corresponding to the F.B. Adjusting Washers,may interfere with the Shutter,thus causing abnomal Shutter operation.**
**Also,short Setscrews may result in faulty installation of the Lens Unit,which will lead to defective focusing.**

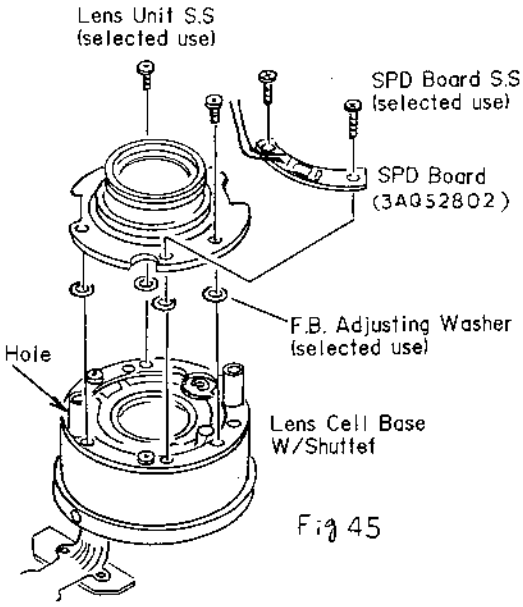
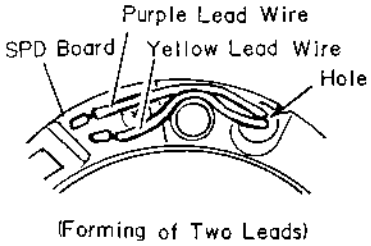


Fig 45

5)Pass the Purple and Yellow Lead Wire from the SPD Board Lead Wires through the hole in the Lens Cell Base,and form them as shown in Fig.46.



(Forming of Two Leads)
Fig 46

[Correspondence Table of F.B.Adjusting Washers & Setscrews]

| Washer | | SPD Board Setscrew 2 pieces | Lens Unit Setscrew 2 pieces |
|---|---|---|---|
| Thickhess | Part No. | | |
| t 0.2 | 60121510 | 63902529 (l 2.5,class3,coating) | 61902229 (l 2.2,class1,coating) |
| t 0.3 | 60131510 | 63903022 (l 3.0,class3,Ni) | 61902522 (l 2.5,class1,Ni) |
| t 0.4 | 60141510 | | |
| t 0.5 | 60151510 | | |
| t 0.6 | 60161510 | 63903326 (l 3.3,class3,black zinc) | 61902826 (l 2.8,class3,black zinc) |
| t 0.7 | 60171510 | | |
| t 0.8 | 60181510 | | |

6)Pass the Orange,Black,Green and Gray Lead Wiers from the Diaphram P.C. Board through the hole in the Diaphragm Ring Ass'y (3AQA5100),and fit the Lens Cell Front Ring Ass'y (3AQA5000) to the Diaphragm Ring Ass'y.

Notes: a)Cleen Diaphragm Contact with ether alcohol.
b)Do not bend the Diaphragm Contact.
c)Never touch the patten of the Diaphragm P.C.Board attached underneath the Lens Cell Front Ring Ass'y.

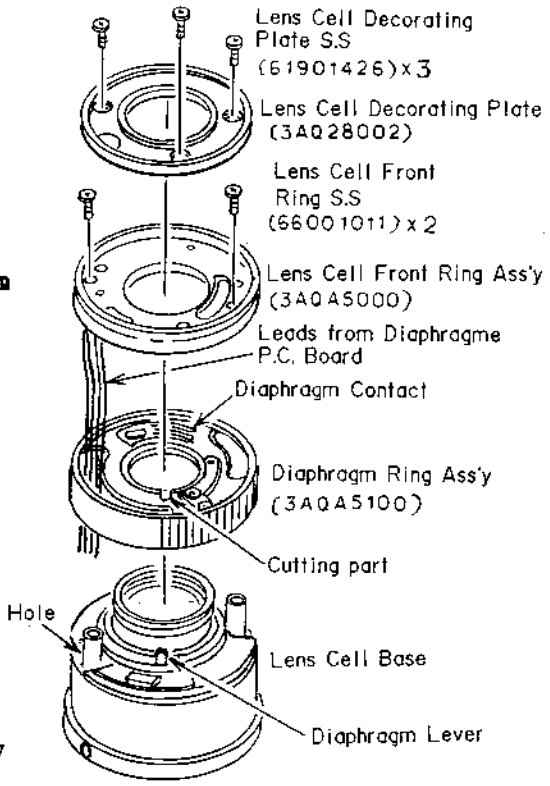
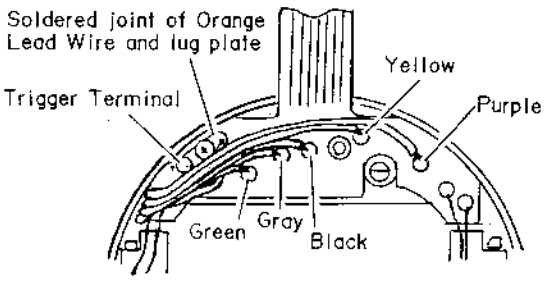


Fig 47

7)Pass the 4 Lead Wires from the Diaphragm P.C.Board through the hole in the Lens Cell Base,and Lead the Lead Wires out from the hole on the shutter side.
8)Fit the Diaphragm Ring Ass'y to the Lens Unit, align the cutting part of Diaphragm Ring Ass'y to Diaphragm Lever,and tighten the Lens Cell Front Ring Setscrews(66001011) X 2.
9)Place the Lens Cell Decorating Plate (3AQ28002),and secure it by tightening the Lens Cell Decorating Plate Setscrews (61901426) X 3.
10)Solder the Yellow and Pueple Lead Wires from the SPD Board and the Orange,Green, Gray and Black Lead Wires from the Diaphragm P.C.board to the Shutter FPC.

Notes: a)In soldering,take care not to allow solder chips and Flux to stick to the Sutter Blades.
b)In the process of production,soldering the Orange Lead Wire to the Trigger Terminal was changed to soldering to the Lug Plate where the Shutter with a Lug Plate.
Do not allow overheating when soldering the Orange Lead Wire allow overheating when soldering the Orange Lead Wire to the Trigger Terminal.



(Old Shutter FPC) Fig 48

c)There are two kinds of Sutter FPC, old and new, which have different soldering positions.Although the Pattern of the Shutter FPC and wiring positions are different,there is no functional difference.with the introduction of the new Shutter FPC, the Lug Plate will be disused.

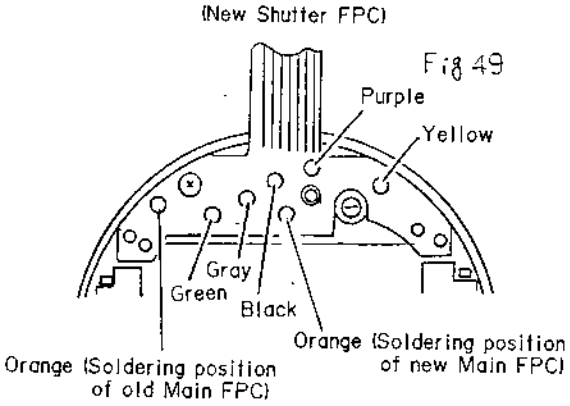


Fig 49

[Notes on Forming Lead Wires]

a)Form the Lead Wires above the surfase Ⓐ. (See Fig.50)
b)In forming the Lead Wires,do not allow any of the Lead Wires rest on the Trigger Terminal, otherwise,the failure of "Power ON" may result,with another Lead Wire sticking in the Lead of the Shutter Trigger protrude to the Sutter FPC from below.

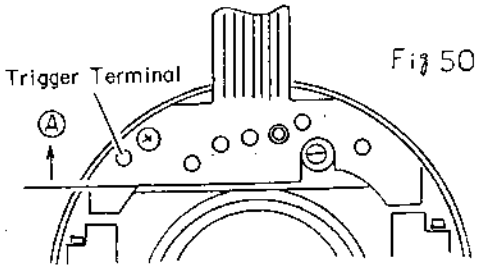


Fig 50

12)Place the Shutter Light-proof Frame (3AQ25802), and secure it by tightening the Shutter Light-proof Setscrews (61902229) X 2.
13)Apply Hanarl FX-16 on the inside periphery of the Lens Barrel Light-proof Frame (3AQ26001).
14)Fit the Lens Barrel Light-proof Frame on the Cam Frame Ass'y (3AQA4700).(See Fig.51)
15)Apply Cemedine 551 to the Fixed Frame Ass'y (3AQA4800).

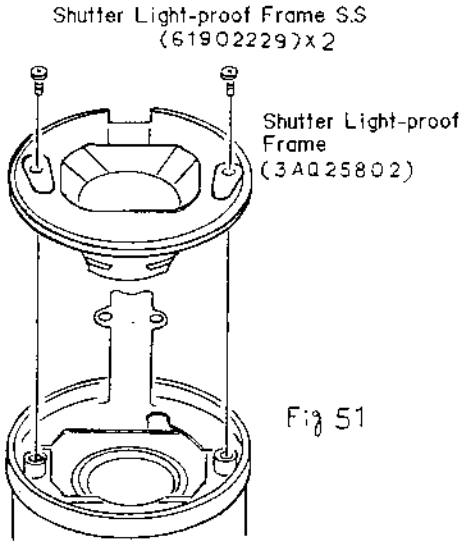


Fig 51

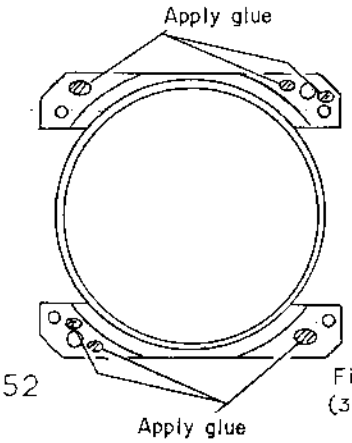


Fig 52

16)Fit the Cam Frame Ass'y W/Lens Barrel Light-proof Frame on the Fixed Frame Ass'y,and stick then together in 4 glued positions. (See Fig.52)
17)Tighten the Lens Cell Cam Shaft (3AQA4700).
18)Turn the Cam Frame Ass'y to check the operation.

**Notes: a)Do not semear or leave fingerprints on the Cam FPC Pattern of the Cam Frame Ass'y.**
**b)After tightering the Lens Cell Cam Shaft,apply the flatting agent F-4 to the screw hole in the Fixed Frame.**

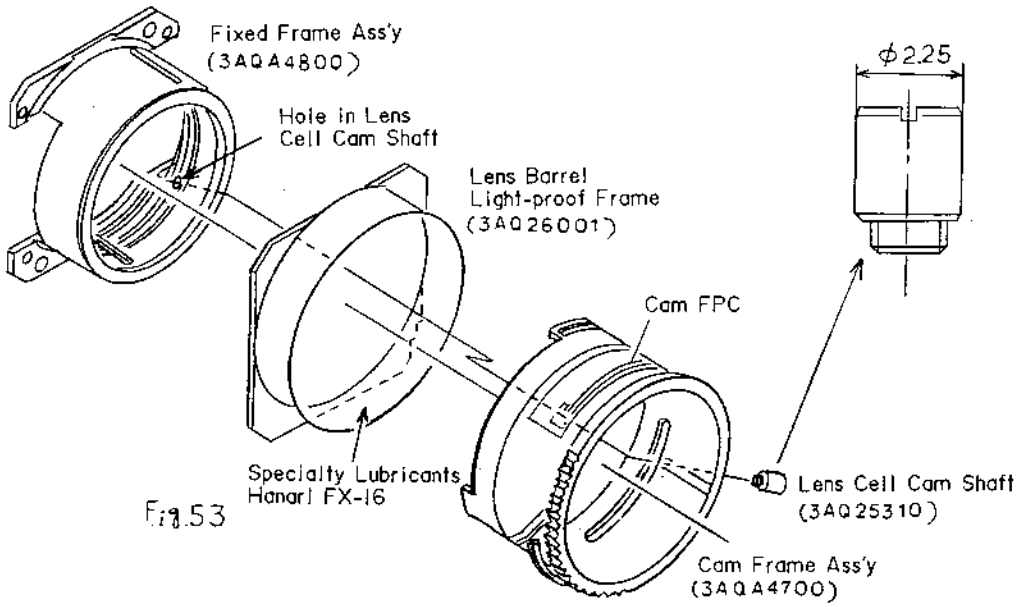


Fig.53

19)Install the assembly of the Fixed Frame Ass'y Lens Barrel Light-proof Frame and Cam Frame Ass'y on the assembly of the Lens Cell Base W/Shutter.
20)Tighten the two Cam Shafts.

**Note: a)There are 5 kinds of Cam Shafts Cam Shaft (1) to Cam Shaft (5),which are used selectively according to the movement of the Refractable Board. and the Cam Shafts (1) to (5) are put into operation by the change in groove width of the Cam Frame.**

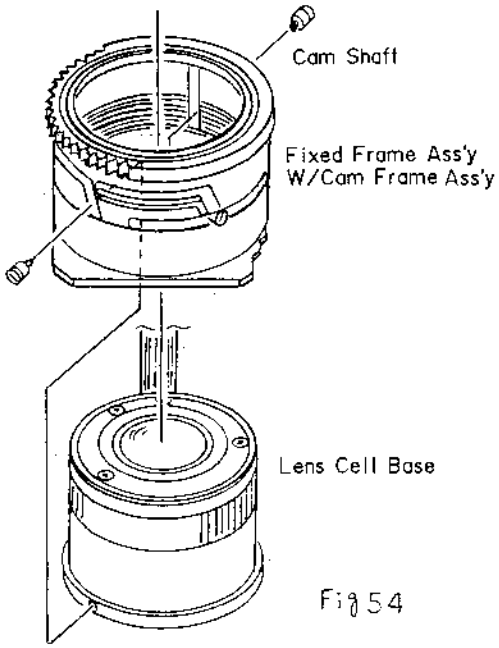


Fig.54

<Dimensions Cam Shafts>

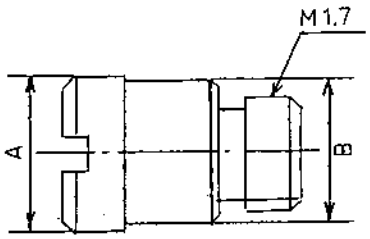



Fig 55

| | A | B |
|---|---|---|
| Cam shaft (1) (3AQ25500) | Φ2.3 | Φ2.16 |
| Cam shaft (2) (3AQ25610) | Φ2.21 | Φ2.2 |
| Cam shaft (3) (3AQ25900) | Φ2.3 | Φ2.1 |
| Cam shaft (4) (3AQ26210) | Φ2.21 | Φ2.15 |
| Cam shaft (5) (3AQ26900) | Φ2.2 | Φ2.17 |

<Differences between New and Old Cam Frame>

○Cam Frame with white mark --------Old Cam Frame

○Cam Frame without white mark------ New Cam Frame

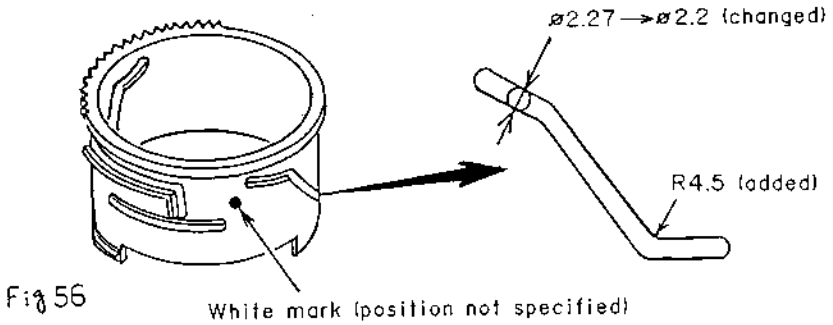



Fig 56

○With old Cam Frame ⟹ Cam Shaft (1)---- 90% use
Cam Shaft (2)
Cam Shaft (3) ---10% use
Cam Shaft (4)

The old Cam Frame employs the Cam Shaft (1) 90% of the time.
For operation hard to be accomplished by Cam Shaft (1), Cam Shaft (2), (3) or (4)is used selectively.

○With new Cam Frame ⟹ Cam Shaft (5)-----100% use
Cam Shaft (2)}
Cam Shaft (4)} Not used currently

The new Cam Frame employs the Cam Shaft (5) 100% of the time.
In case the operation can not be accomplished properly,adjustment is made by Cam Shaft (2) and (4).

**[Application of Grease]**

[A]Lens Cell Base Ass'y
1)Apply Hanarl FX-16 to the whole periphery of the Lens Cell Base.

**Note: a)The Lens Cell Base Ass'y is mostly exposed,so do not apply the glue in position other than specfied.**

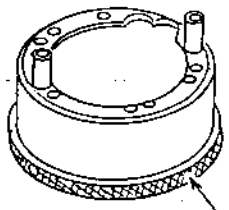
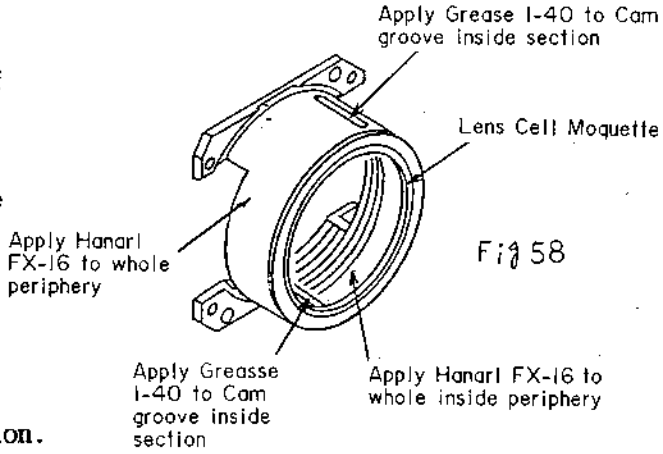


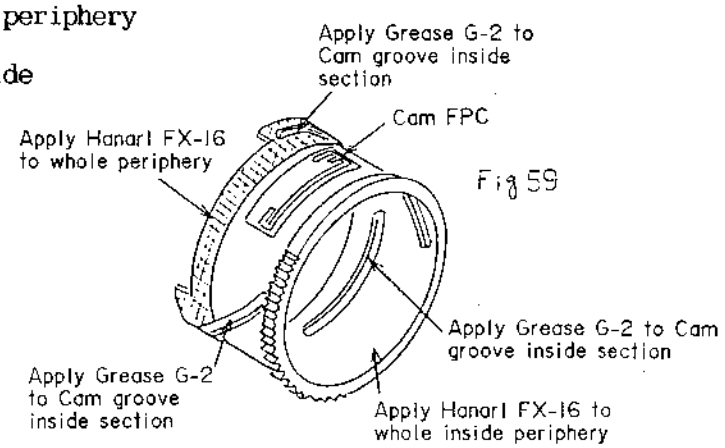
Fig 57

[B]Fixed Frame Ass'y
1)Apply Hanarl FX-16 the whole periphery of the Fixed Frame.
2)Apply Hanarl FX-16 to the whole inside periphery of the Fixed Frame.
3)Apply Grease I-40 to the Cam grove inside section (2 position).

**Notes: a)The Lens Cell Moquette is exposed, so take perticular care to apply evenly.**
**b)Do not allow Grease I-40 to spill out of the Cam groove inside section.**


Apply Grease I-40 to Cam groove inside section
Lens Cell Moquette
Apply Hanarl FX-16 to whole periphery
Apply Greasse I-40 to Cam groove inside section
Apply Hanarl FX-16 to whole inside periphery
Fig 58

[C]Cam Frame Ass'y
1)Apply Hanarl FX-16 to the indicated periphery of the Cam Frame.
2)Apply Hanarl FX-16 to the whole inside periphery of the Cam Frame.


Apply Grease G-2 to Cam groove inside section
Cam FPC
Apply Hanarl FX-16 to whole periphery
Apply Grease G-2 to Cam groove inside section
Apply Grease G-2 to Cam groove inside section
Apply Hanarl FX-16 to whole inside periphery
Fig 59

3)Apply Grease G-2 to the Cam groove inside section (3 positions.)
4)Apply Grease G-2 to the barrier pin operation wall and groove.(See Fig.60)

**Notes: a)Do not apply Hanarl FX-16 in such a may that it spills over the FPC.**
**b)Do not allow Grease G-2 to spill out of the indicated area.**

5)Wipe clean the pattern of the Cam FPC withe ther alcohol.

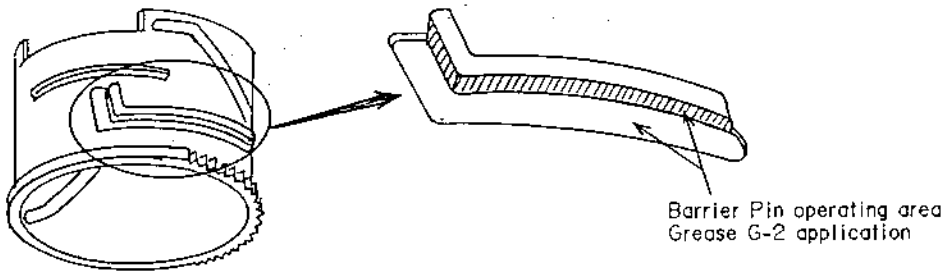


Fig 60

**[Positions of Soldering Leads to Diaphragm P.C.Board]**

1)Solder the black,Orange,Green and Gray Lead Wires to the Diaphragm P.C.Board as shown in Fig.61.
2)Wipe clean the pattern of the Diaphragm P.C.Board.

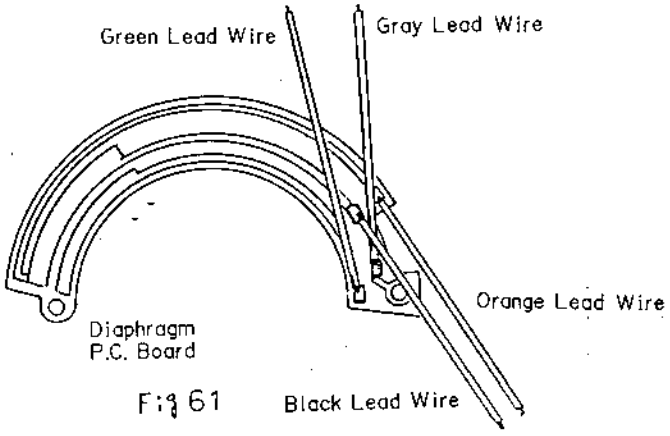


Fig 61

**[Position of Soldering Lead to SPD Board]**

1)Solder the Purple and Yellow Lead Wires to the SPD Board as shown in Fig.62.

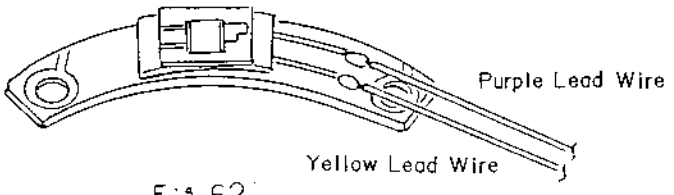


Fig 62

[Sticking of Lens cell Moquette to Fixed Frame]

1)Wipe off the oil or other foreign matter from the Fixed Frame where the Lens Cell Moquette is stuck,using ether alcohol.
2)Peel the backing paper of the Lens Cell Moquette (3AQ26540), and stick it around the periphery along the wall of the Fixed Frame.
Stick in such a way that oblique ends of the Lens Cell Moquette meet each other.
3)Then press the Lens Cell Moquette securely with your fingers so that it will not peel off.

Note: a)Where the lens abvanced irregularly,stick the Fixed Frame Auxiliary Sheet before sticking the Lens Moquette over it.

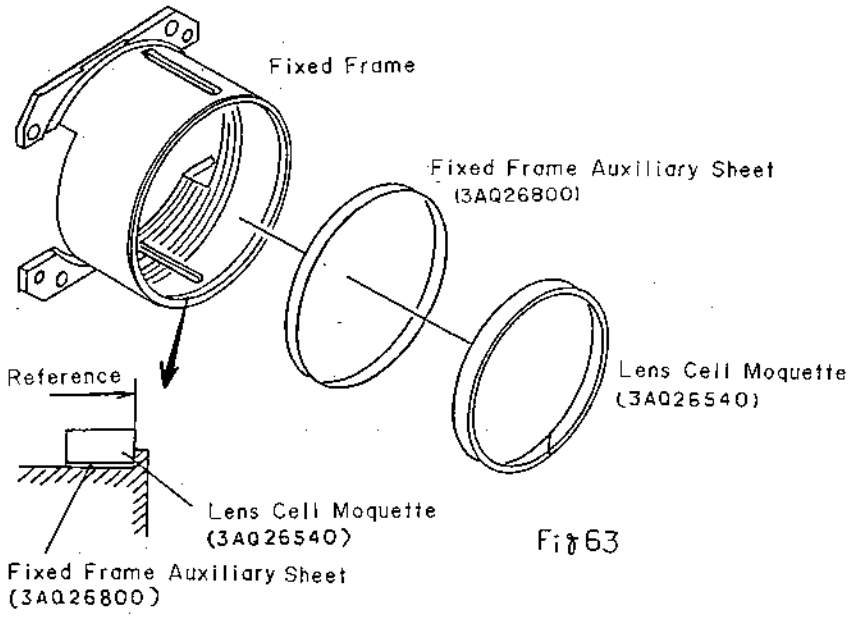


Fig63

[Notes after Installation of Fixed Frame Ass'y and Lens Cell Base Ass'y]

1)The end of the lens Cell Front Ring is projecting by about 0.1mm in radius,so that the resistance is large when the Lens Ass'y passes over the Lens Cell Moquette,but it drops after passage.
2)Do not allow the Lens Cell Moquette to be caught in the gap Ⓐ after installation. Otherwise,the Lens will not move smoothly.

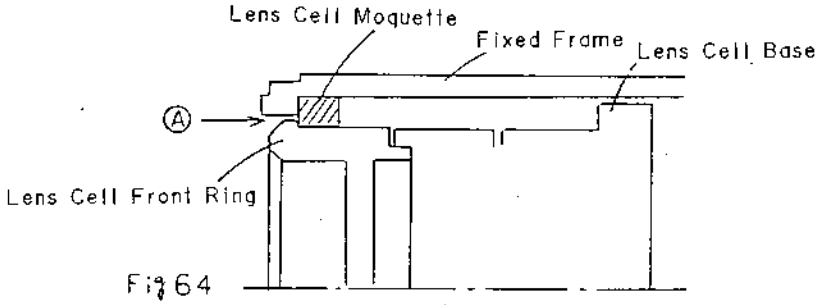


Fig64

C-1-3 Reassembly of Lock Plate Cover

1)Fit the Lock Plate Cover (3AQ11010) on the Release knob (3AQ11700).
2)Install the Lock Plate Ass'y (3AQA5400) after applying Grease I-40 to it.
3)Tighten the Lock Plate Ass'y Setscrews (66001142) X 2.
4)Engage the Lock Plate Spring (3AQ11401).(See Fig.67)

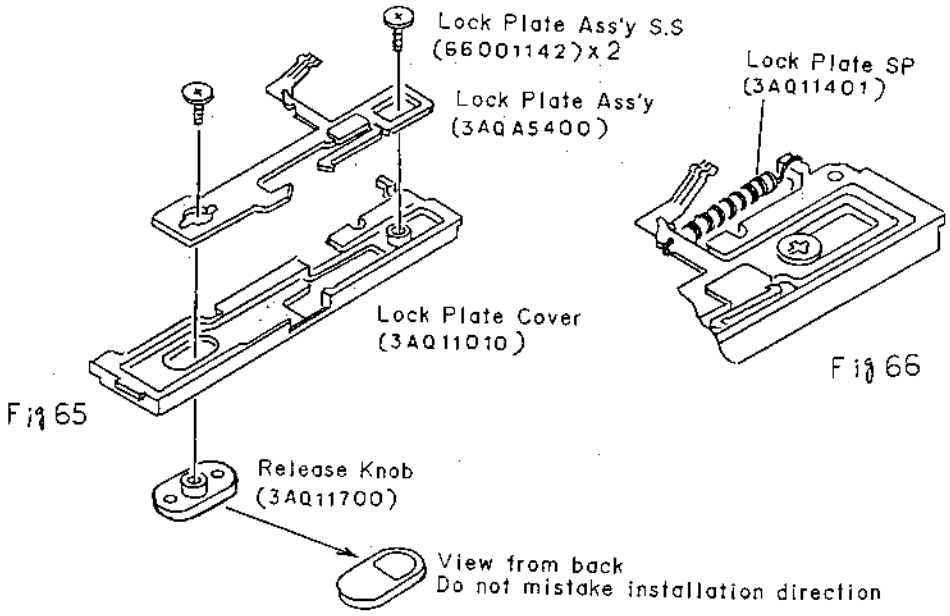



Fig 65




Fig 66

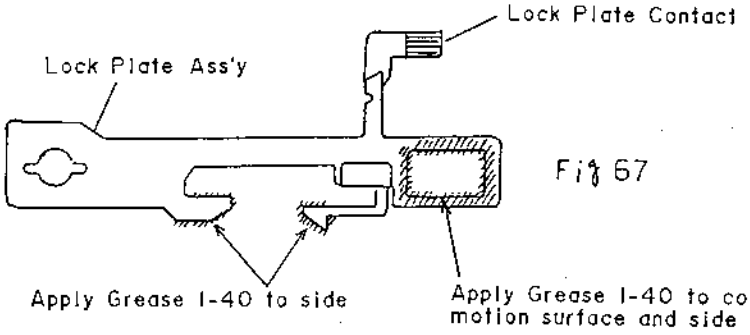



Fig 67

Note: a)Do not the Lock Plate Contact deformed or dirty.

C-1-4 Reassembly of F-D Base

1)Solder the Operation FPC (3AQ50601) to the F-D P.C.Board (3AQ5201) in four positions.

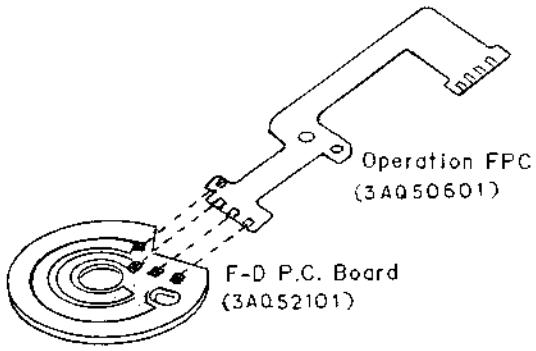



Fig 68

2)Apply Glue C-551 to the F-D Base (3AQ30210) in three positions.
3)Pass the Operation FPC through the hole as indicated by the arrow,and stick the F-D P.C. Board.
4)Apply Grease H-26 to the Click Spring (3AQ30800) and Steel Ball (66701220), and install them on the F-D Base.
5)Apply a thin layer of Grease H-26 on the groove of the F-D Contact of the Focus Dial Ass'y (3AQA4200), install the Focus Dial Ass'y and secure it by tightening the Focus Dial Setscerw (66001141).

**Note: a)Do not make the F-D Contact deformed or dirty.**

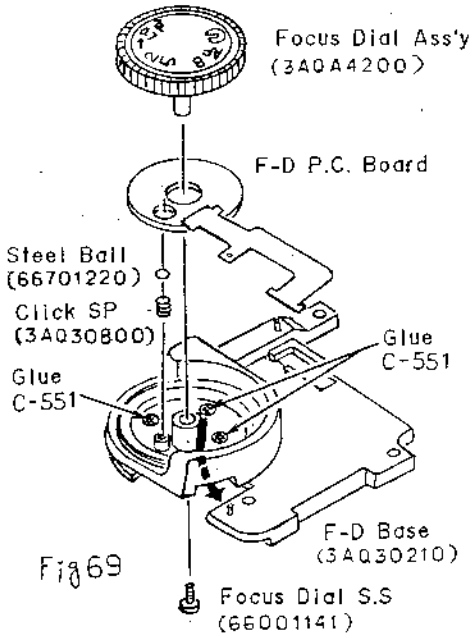



Fig 69

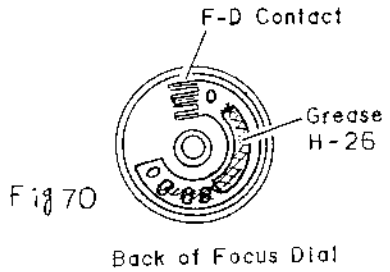



Fig 70

Back of Focus Dial

## C-1-5 Reassmbly of Exp.Compensation Dial Ass'y

1)Put the Click Spring (3AQ30600)in,and place the Steel Ball (66701220) on it.
2)Apply Grease H-26 to the back side of the Exp. Compensation Dial Ass'y (3AQA3900),set it in place and secure it by tightening the Exp.Compensation Dial Setscrew (66001147).

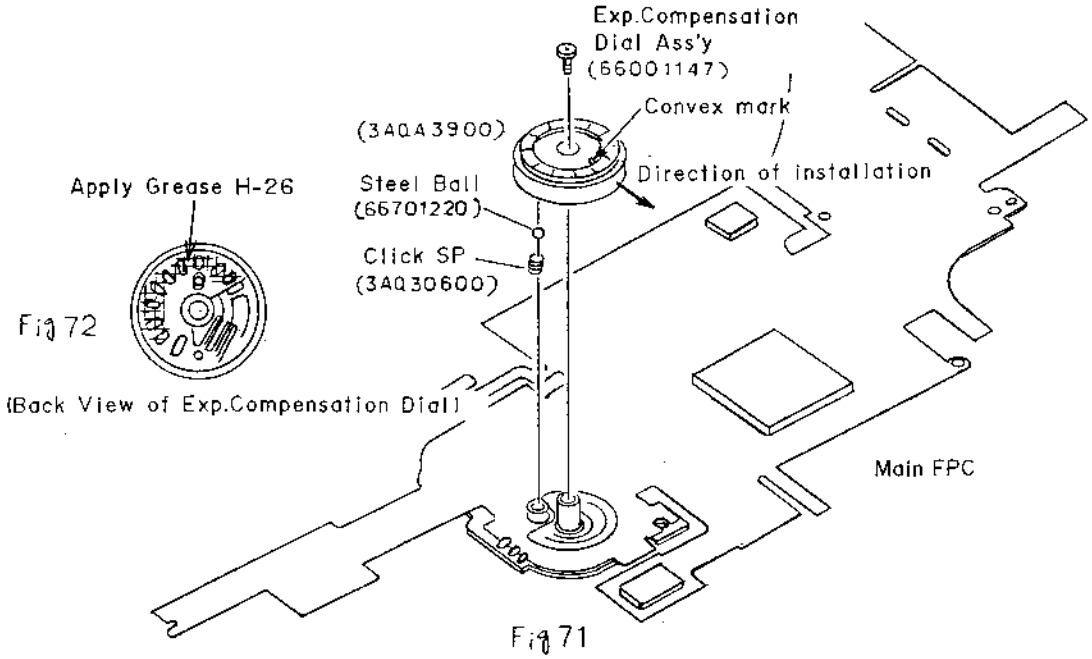



Fig 72

(Back View of Exp.Compensation Dial)

Fig 71

## C-1-6 Reassembly of MM Base Plate (Lower) Ass'y

1)Apply Grease H-26 to the R-shaft.
2)Place the Rewind Gear (3AQ63001),Rewind Fork Spring (3AQ69100) and Rewind Fork (37862701) in this order,and secure them by tightering the Rewind Fork Setscrew (66001042).
3)Check to make certain that the Rewind Gear operates smoothly and the Rewind Fork, when pressed,comes back under the force of the Rewind Fork Spring.

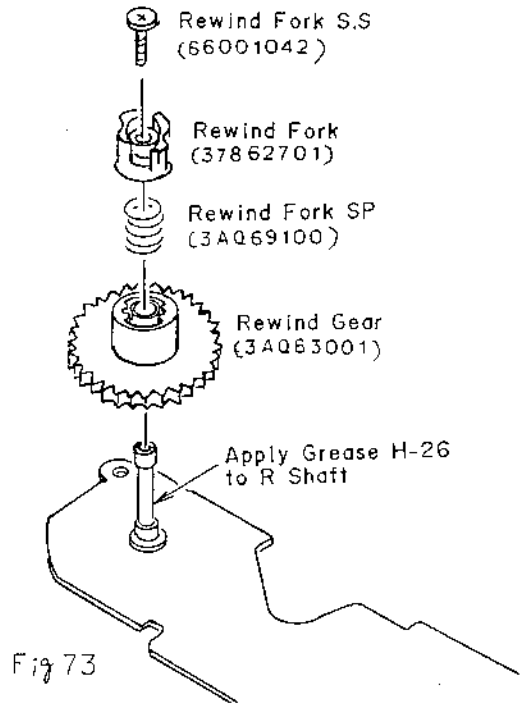



Fig 73

[Sticking MM Light-proof Cloth to Old MM Base Plate (Lower)]

a)Stick MM Light-proof Cloth (3AQ69000) to the MM Base Plate (Lower) Ass'y to prevent interfernce between the rising part of the Epicylic Gear Lever and the Sub FPC.

b)In sticking the cloth,do not cover the slot and other holes.

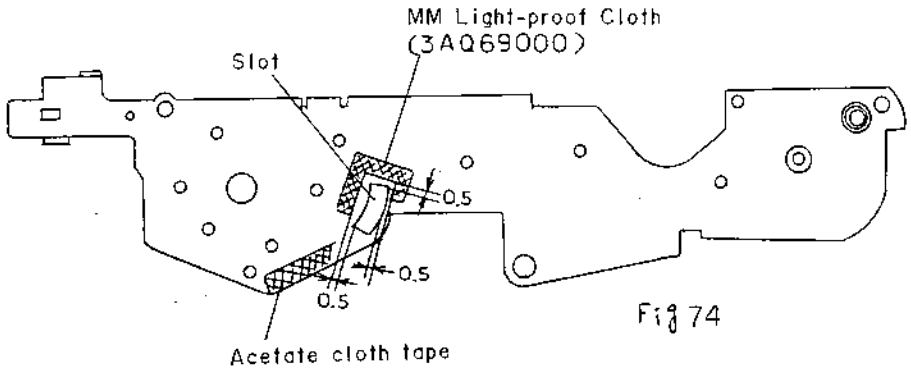



Fig 74

[Sticking Insulation Acetate Cloth Tape to New MMBase Plate (Lower)]

a)Sticking acetate cloth tape for insulation as shown below.

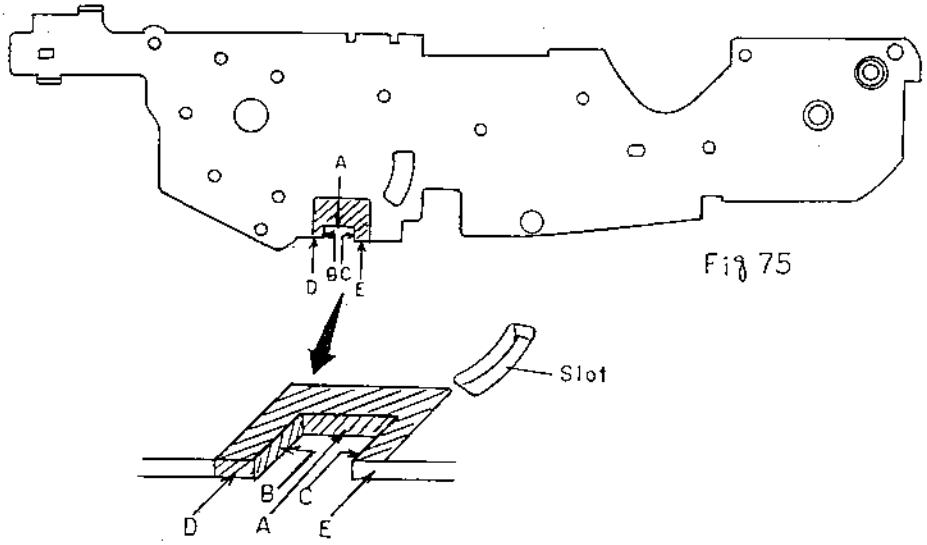



Fig 75

b)Stick the such a way as cover the surfaces A,B,C and D. Do not allow the tape to cover the surface E.

c)In sticking the tape,do not cover the slot other holes.

## C-1-7 Affixing AF Window Moquette to Viewfinder Ass'y

*There are cases of the infrared beam for Auto Focus directly entering the light receiving lens. In such cases, accuracy can be lost in far distance (∞) metering. To prevent it, the AF Window Moquette (3) (3AQ86006) must be affixed between the object lens and the light receiving lens.

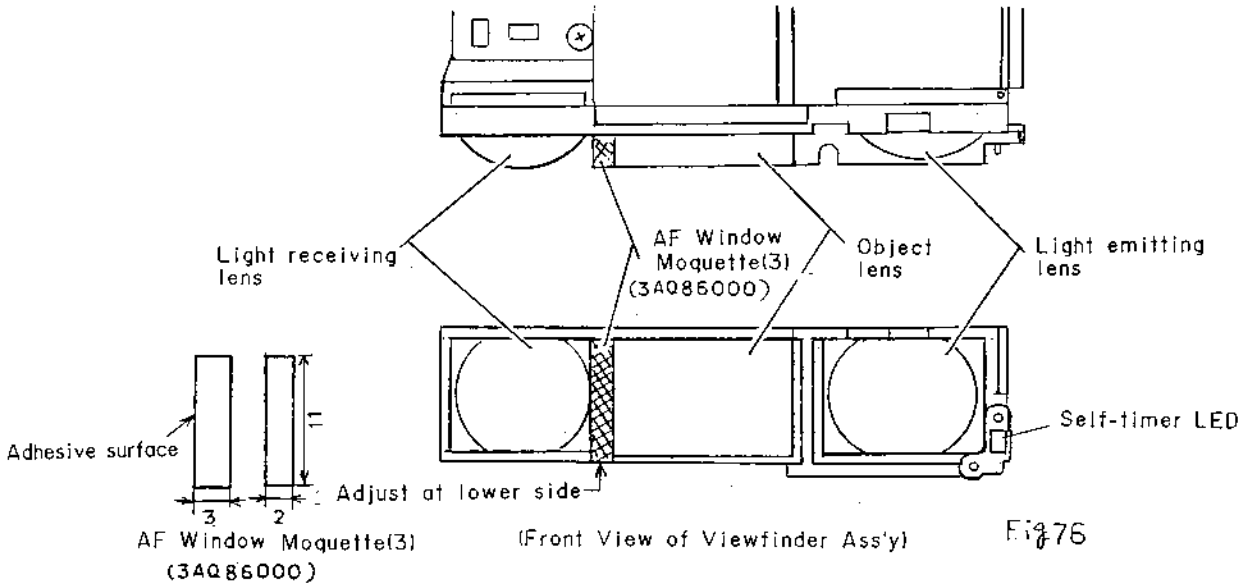



Fig76

a)Affix the Moquette after installing the Viewfinder Ass'y to the Body.

b)Take care that the adhesive surface of the AF Window Moquette (3) does not stick to the side of the object lens. (The appearence with the Top Cover installed is not set is factory.)

c)In installing the Top Cover Ass'y,take care that the Moquette may not tear or peel off.

d)Take care that the Moquette does not project toward the object lens.

## C-1-8 Affixing AF Window Moquette to Top Cover Ass'y

a)Affix the AF Window Moquette (3AQ85504) to prevent LCD display loss above the Counter Window.

b)Viewed from outside,the Moquette must not be projecting from the Counter Window.

c)Affix the AF Window Moquette (2) (3AQ85600) to the lighting emitting window to prevent the leakage of AF LED light.

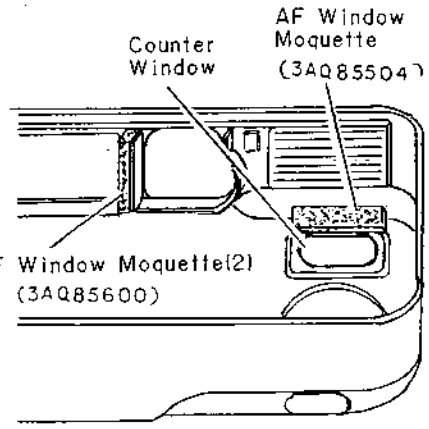



Fig77

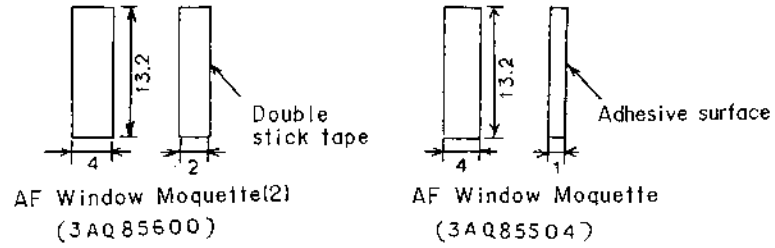



Fig 78

**C-1-9 Affixing Insulator (Back)**

a)Affix the Insulator (Back) (3AQ81600) to the inside of the Top Cover to prevent part of the Main FPC from contacting the Top Cover.

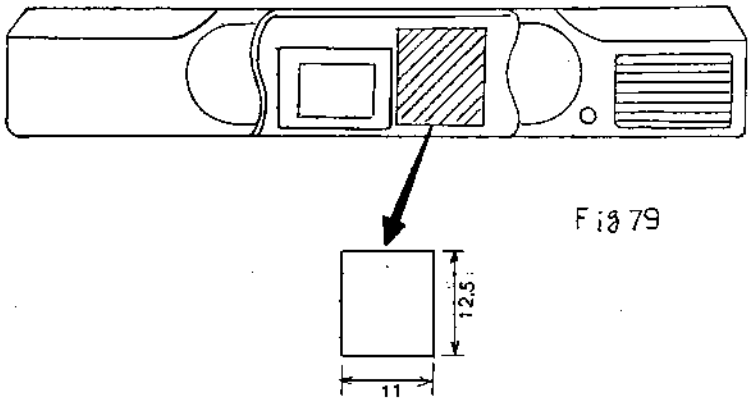



Fig 79

C-2 Reassembly and Forming of Parts in Camera Body

C-2-1 Installation of Capacitors and Coil

1)Stick four double stick tapes to the Body.

2)Install the Coil (5ECER5522700101).

3)Install the Electrolytic Capacitor (100 μF) (5ECEROJ10156*01).

4)Install the Electrolytic Capacitor (470 μF) (5ECEROJ47156*01).

5)Forming Lead Wires and fix then with Glue C-551 in three positions.

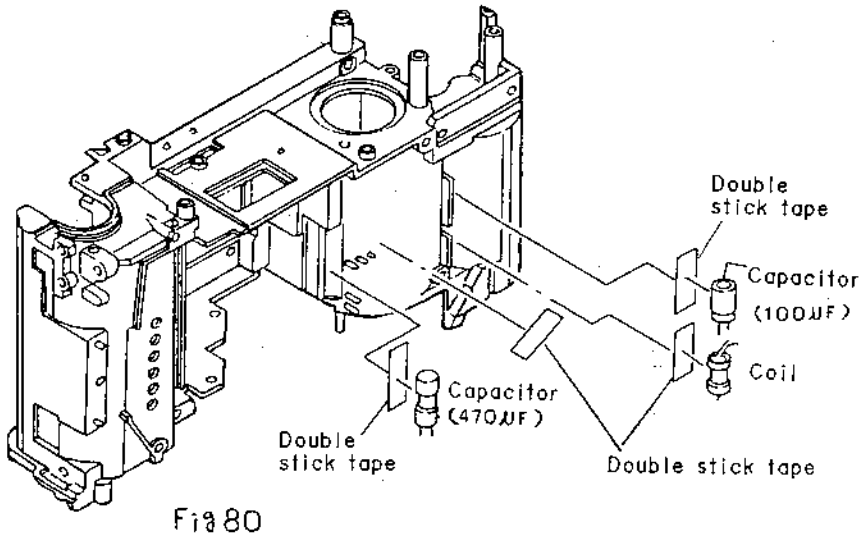



Fig 80

Note: a)The coil terminal,if installed in front (right above), will interfere with the AF Front Plate Ass'y. Hence,install in such a way that the coil terminal is the left.

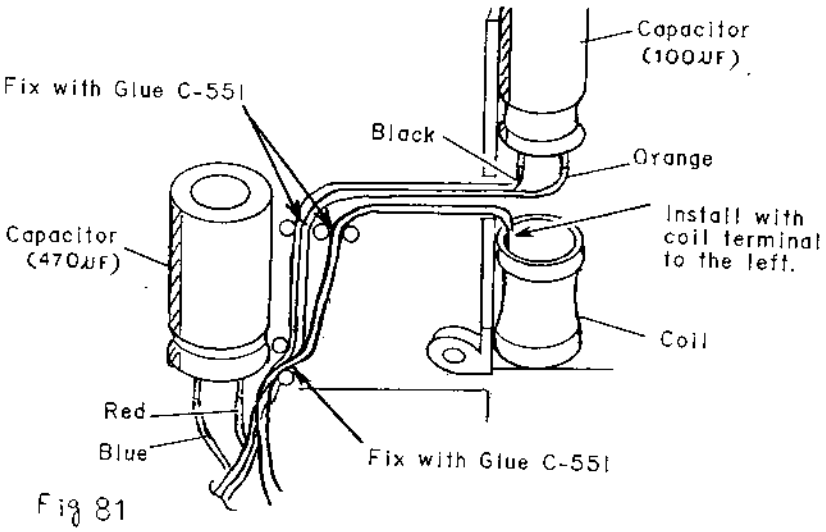



Fig 81

C-2-2 Sticking Cam FPC Forming Tape

1)Stick the doule stick tape for forming the Cam FPC as follows:

a)Use the break in the body rib as reference for vertical position.

b)Use the top of R of the Battely Case as the center of the horizontal position.

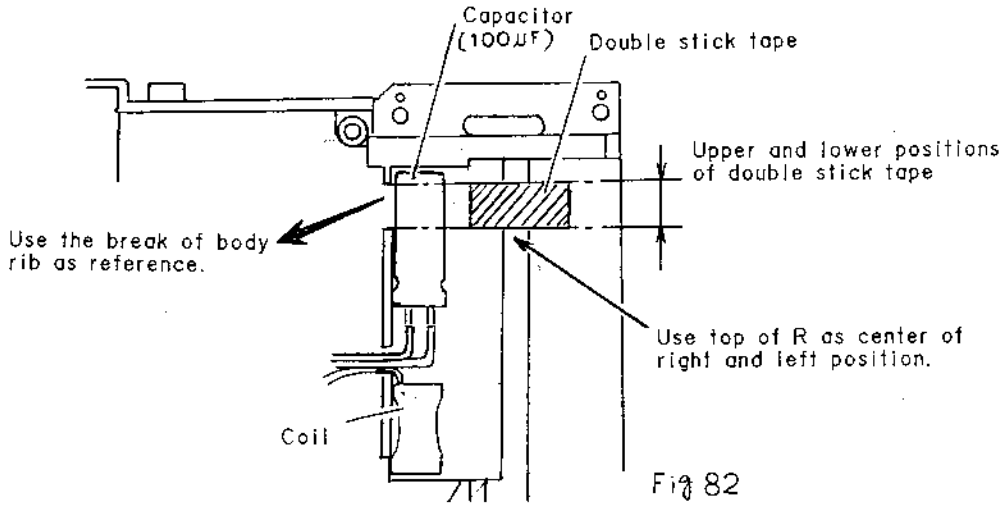


Fig 82

C-2-3 Installation of AL Roller Holder

1)Apply Grease HK-9 to the two bearings of the AL Roller (39662500),and install the AL Roller Holder (39662600).

2)After installation,adjust the position so that the hinge of the AL Roller Hollder is each positioned in the middle of the bearing of the AL Roller. (See Fig.84)

3)Check to make sure that the AL Roler turn smoothly.

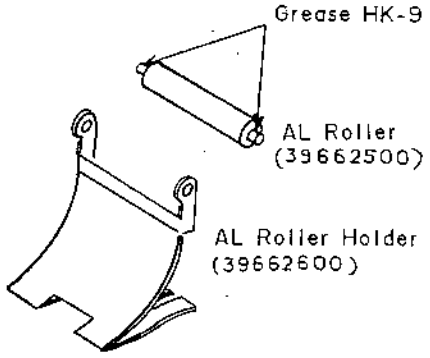


Fig 83

**Note: a)Do not allow Grease to stick to the AL Roller surface.**

4)Press-fit the AL Roller Holder in the Body.

5)Fix the AL Roller Holder with Three-Bond 1521B. (See Fig.85)

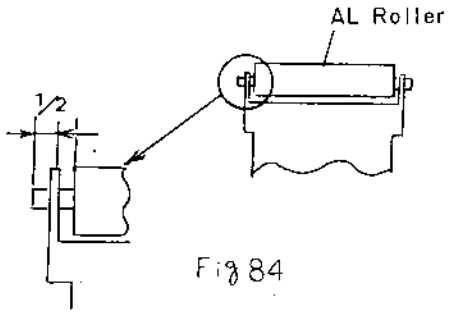


Fig 84

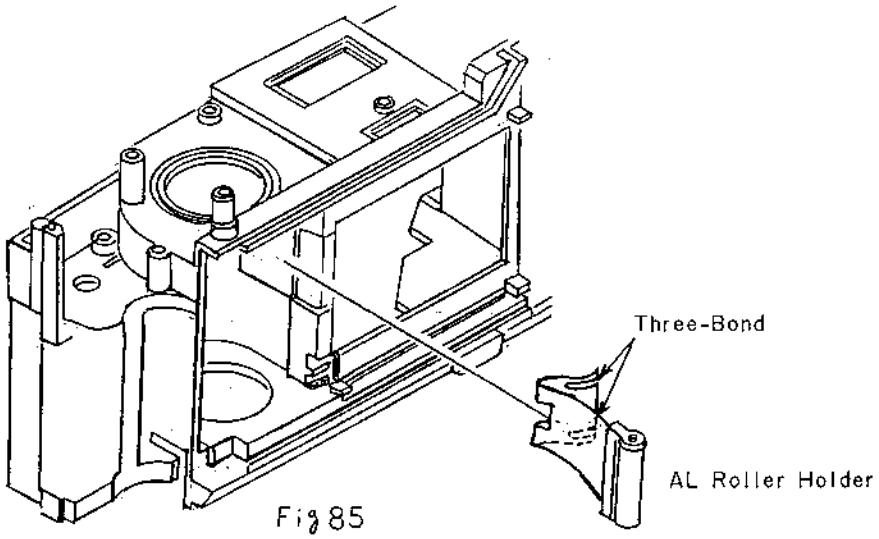



Fig 85

**C-2-4 Forming of Lead Wires on Sub FPC**

In soldering the Lead Wires on the Sub FPC, arrange them with care so that they do not run over the hole into which the riser of the MM gear link plate (epicyclic gear lever) of the MM Base Plate (Lower) enters and the Barrier Fixing Screw holding the barrier rotation shaft (Barrier Spring).

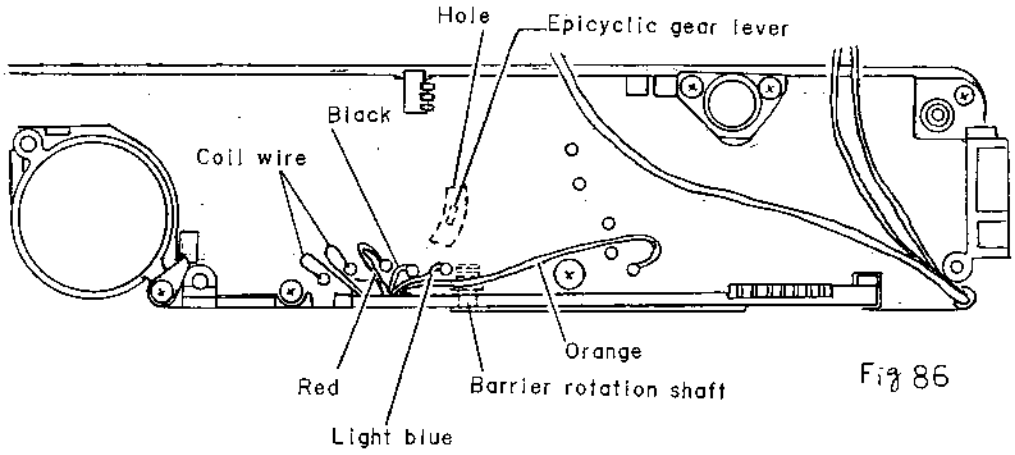



Fig 86

**Note:** a) Do not allow any of the lead wires and the coil wire to cross each other.
b) Solder the lead wires in the lower part of the camera body as flat as possible.

**Reasons:** Without the above precautions, there may be cases of winding or rewinding failure with the bottom cover installed, incomplete barrier close or power-on failure.

C-2-5 Forming of Lead Wires of Flash Unit

1)To prevent flash failure,be sure to pass a total of three Lead Wires, namely, two Winding Motor (purple,blue) Lead Wires and one Power Lead Wire (red) between the Flash B P.C. Board and the battery chamber.
Also,be sure fo pass the Lead Wire (yellow) for emission LED in the back of the Main Capacitor of the Flash.

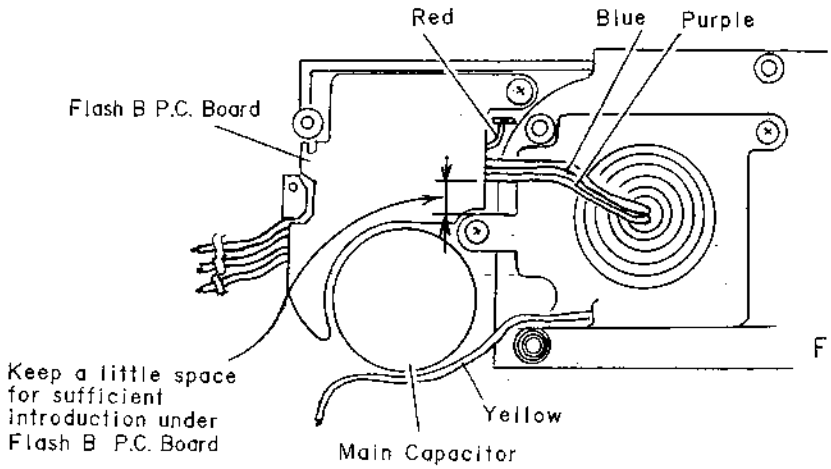



Fig 87

**Note: a)To prevent the breaking of Lead Wires,do not allow then to cross each other or touch the pins or like projections of the electronic parts of the Flash B P.C. Board.**

2)There are two Flash P.C.Boards,upper and lower,which are connected with Leads. If these Lead Wires (blue, white, black, yellow, orange,) are stowed on the Flash A P.C. Board crossing one another,then no space will be left between the Exposure Compensation P.C.Board and the Flash A P.C. Board. This can cause the breaking of the Lead Wires or the lifting of the Exp. Compensation P.C. Board,resulting in the failure of the installation of the P.C. Board. Therefore,in forming the Lead Wires,fry to spread them apart from each other as far as practicable.

3)Do not allow the black (GND) and red (⊕) Leads to run over the R part of the Flash A P.C. Board. Otherwise,interference with the Top Cover may result in the breakage of the Lead Wires.

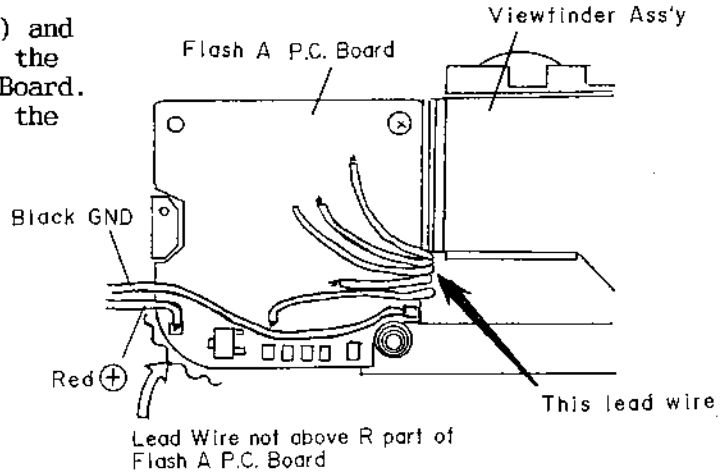



Fig 88

## C-2-6 Installation of Self-timer LED

1)Stick the Photometry Cover Adhesive Tape (1AA66500) to the Viewfinder Ass'y.
2)Apply glue (Cemedine 551) to the Photometry Cover Adhesive Tape,and affix the Self-timer section of the Main FPC on it.

Note: a)The Self-timer LED must not be dislocated or floating with the pins of the Viewfinder in the holes of the Main FPC.

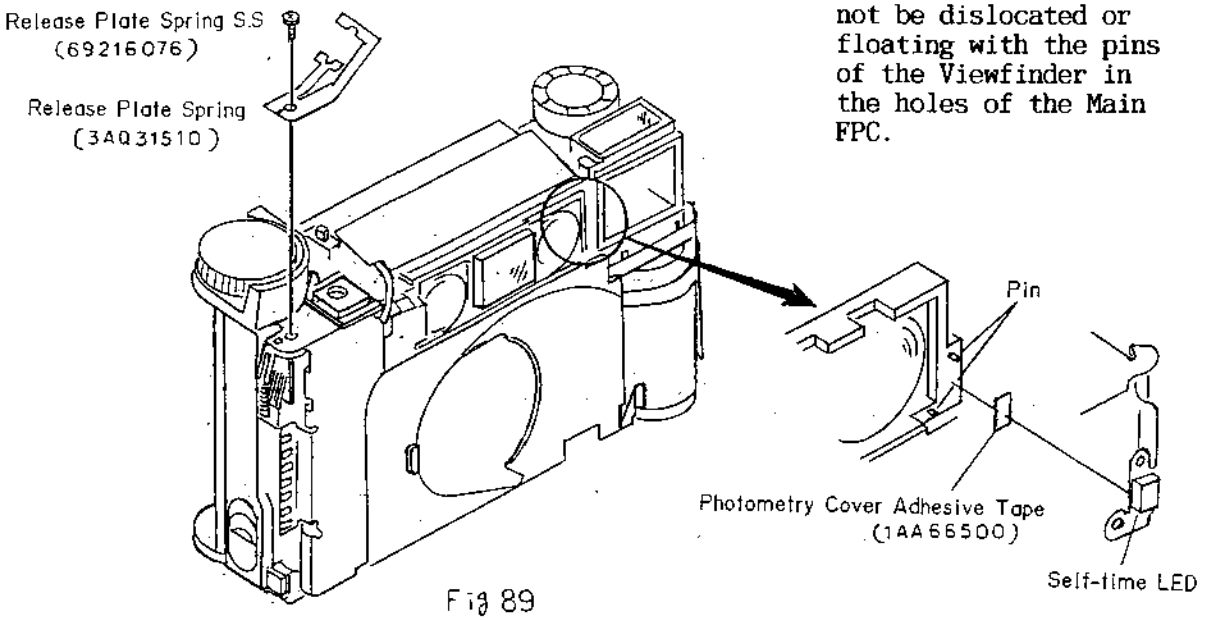



Fig 89

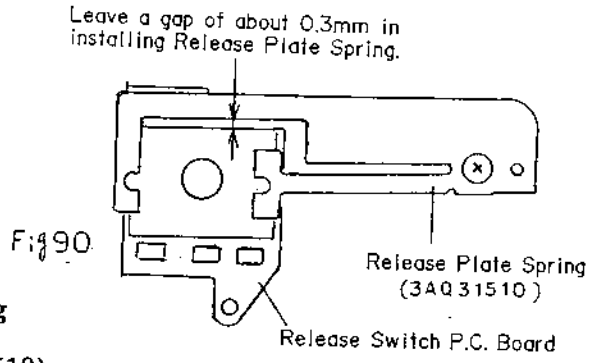



Fig90

## C-2-7 Installation of Release Plate Spring

1)Install the Release Plate Spring (3AQ31510) and secure it by tightening the Release Plate Spring Setscrew (69216076).

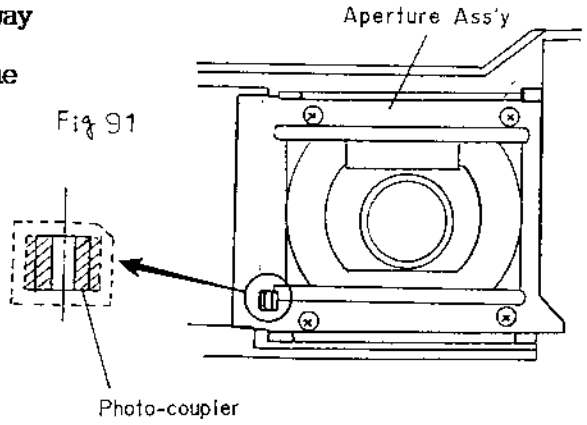
**[Notes on Installation of Release Plate Spring]**

Be sure to install the Release Plate Spring (3AQ31510) in proper position. Otherwise,the Spring can interfere with the Release Switch P.C. Board or the Release Buttom,so that the shutter release may not occur smoothly.
Provide a gap of about 0.3mm between the Release Switch P.C. Board and the Release Plate Spring. After installing the Release Plate Spring, make certain that there is no interference between the Release Plate Spring and the Release Switch P.C. Board.

C-2-8 Notes on Installation of Aperture Ass'y

a)In installing,take care not to bend the Aperture Ass'y (3AQA1400) which is thin. The Aperture Ass'y, bent,can turn on the rewinding mode during film winding.
b)Position the Aperture Ass'y in such a way that the center of the window for the photo-coupler comes to the center of the photo-coupler.

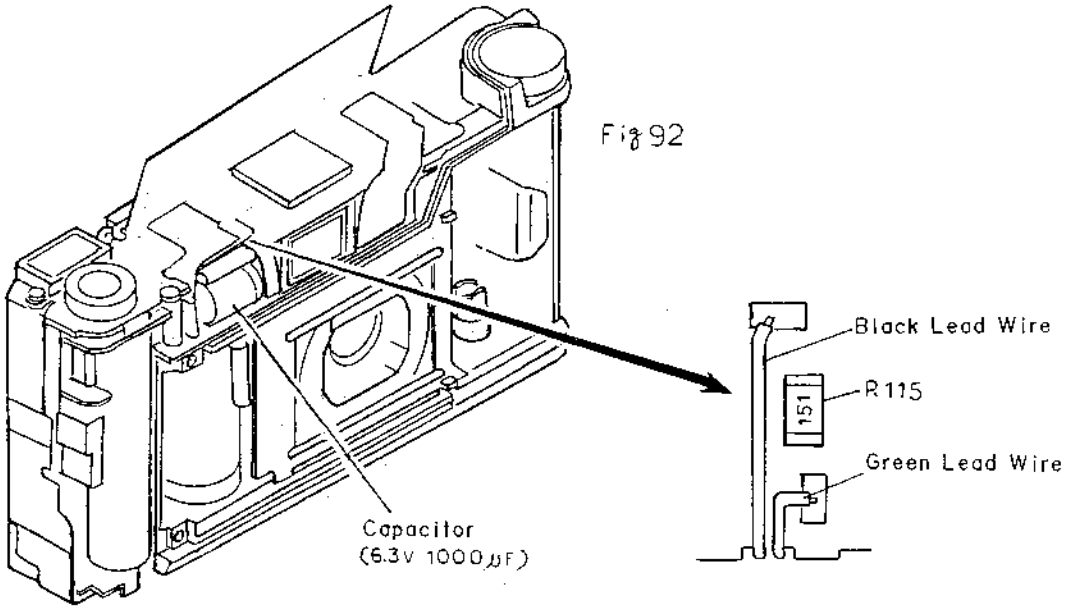
Fig 91




C-2-9 Note on positioning of Black Lead of Capacitor

a)Do not the Black Lead Wire,which is to be soldered between the Capacitor (6.3V,1000μF) for AF infrared LED emission and the Main FPC,to pass over R115.
The Black Lead Wire passing directly over R115 can have the insulation broken during the installation of the Top Cover and thus short-circuit with R115. This will result in the failure of AF infrared LED emission and abnormal pulse.

Fig 92



C-2-10 Installation of Lens Cell Name Plate and Exp. Compensation Dial Name Plate

1)Attach the Exp. Compensation Dial Packing (3AQ32920) to the Exp. Compensation Dial (3AQ32219).
Apply the Glue (Cemedine 551) to the periphery of the Exp. Compensation Dial and Exp. Compensation Dial Packing,and affix the Exp. Compensation Decorating Plate (3AQ32303).

**Note: a)Be sure to apply the Glue (Cemediue 551) closely to the whole periphery of the Exp. Compensation Dial Packing. Particularly, pay special attention to the neighborhood of the gate. In complete gluing, if any, can lead to the destruction of the CPU due to high static electricity.**

2)Apply the Glue (Cemedine 551) to the Lens Cell Decorating Plate. Then affix the Lens Cell Name Plate (3AQ28300).

3)Stick the Front Grip Tape (3AQ28300) to the Front Grip (3AQ35300).
Peel off the backing paper and stick the Front Grip to the Body.

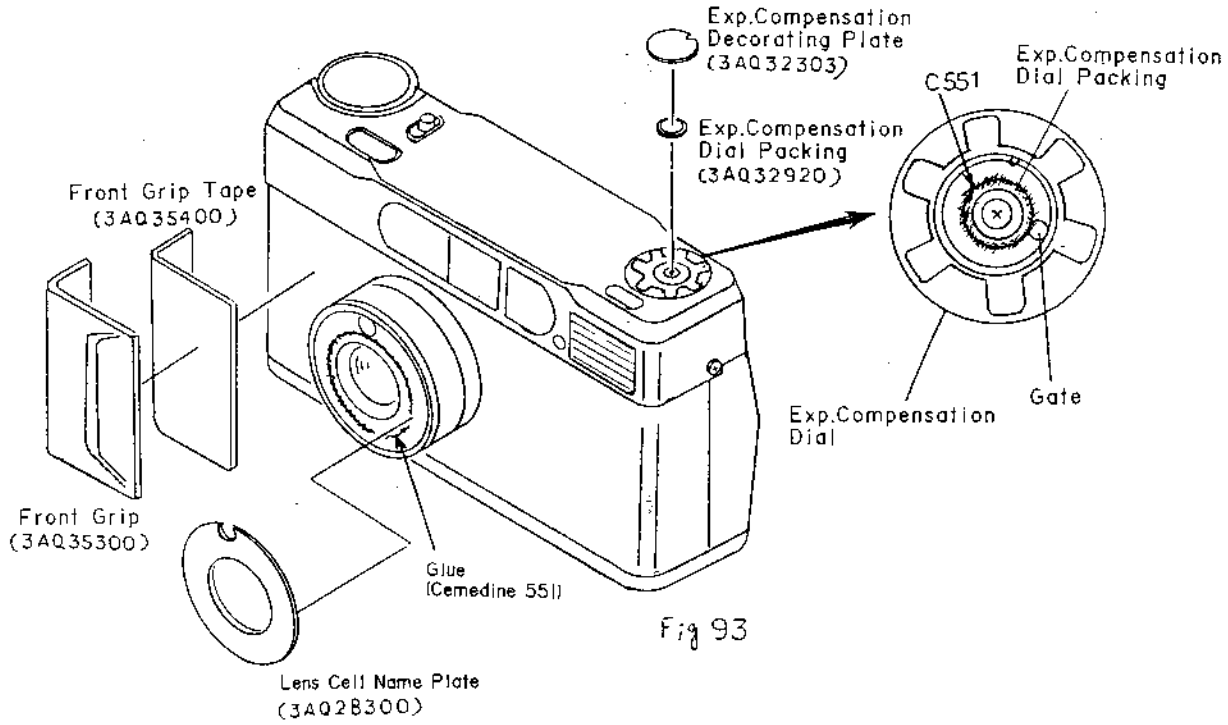
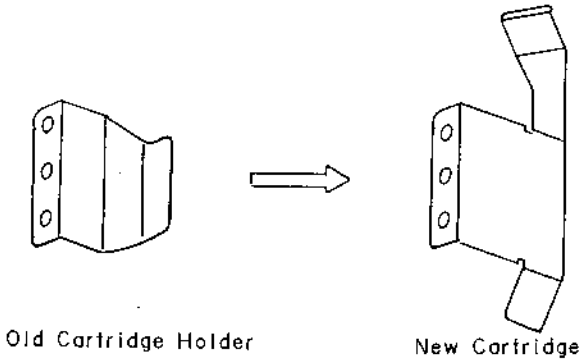



Fig 93

## C-3 Modified Parts

### C-3-1 Modification of Cartridge Holder

There have been cases of rewinding started during film winding,depending on how the film was loaded (cartridge up). To correct this trouble,the cartridge holder has been modified.



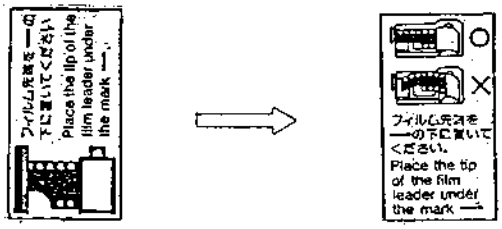
Old Cartridge Holder
(37811500)

New Cartridge Holder
(3AQ19100)

Fig 94

### C-3-2 Explanation Seal

There have been cases of rewinding started during film winding, depending on how the film was loaded (film rising into the film guide). Hence, the instruction on the Explanation Seal has been modified.




Old Explanation Seal
(37810700)

New Explanation Seal
(38411900)

Fig 95

## C-3-3 Modification of MM Base Plate (Upper) and MM Base Plate (Lower)

As a result of the installation of the barrier adjusting mechanism, the Camera Body, MM Base Plate (Upper) and MM Base Plate (Lower) underwent respective form shape change and the Barrier Base Plate Ass'y was added.

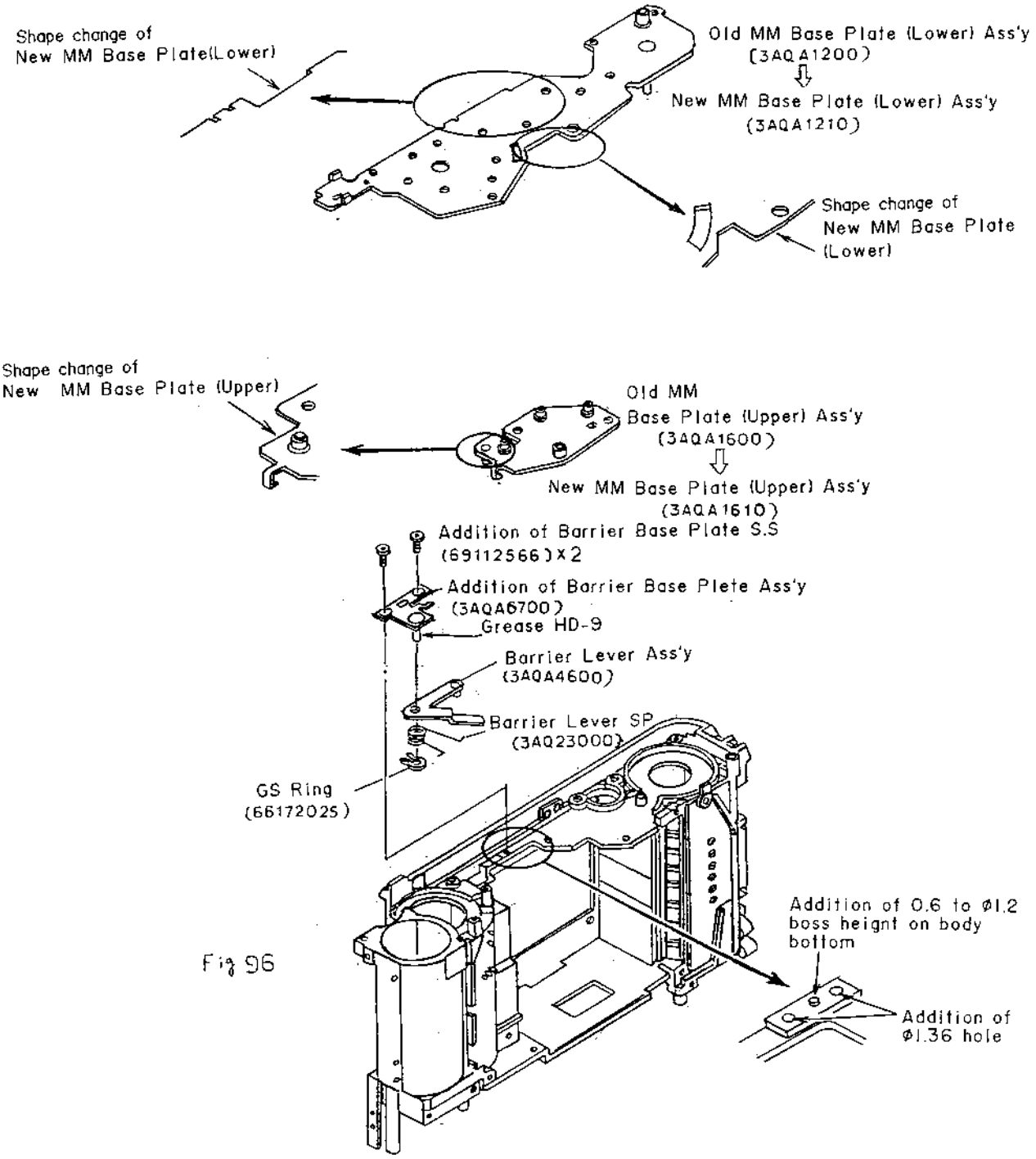



Fig 96

[Barrier Open Adjustment]

1)Apply Grease HD-9 to the Pin of the Barrier Base Plate Ass'y, and install the Barrier Lever Ass'y (3ABA4600).
2)Install the Barrier Lever Spring (3AQ23000),and secure it with the GS Ring (66172025).(See Fig.96)

**Note: a)Besure to install the GS Ring in parallel.**
**Do not open the GS Ring too far to cause play.**

(Top View of Camera)

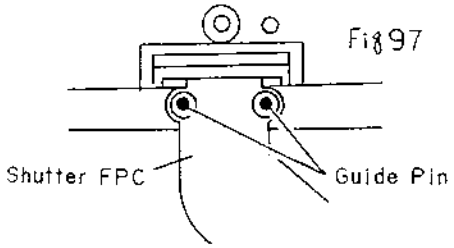



Fig97

3)Pass the Shutter FPC of the Lens Barral Ass'y (3AQA1800) through the hole Ⓐ from inside of the Body.(See Fig.98)
Take out the Shutter FPC till the holes meet the Guide Pin of the Body before installing the Lens Barrel Ass'y (See Fig.97)
4)Secure the Aperture Ass'y (3AQA1400) by tightening the Aperture Setscrews (61812528) x 4 diagonally.
5)Install the Cam Switch Ass'y (3AQA1700) with care not to deform,and secure it by tightening the Cam Switch Setscrew (69214576).

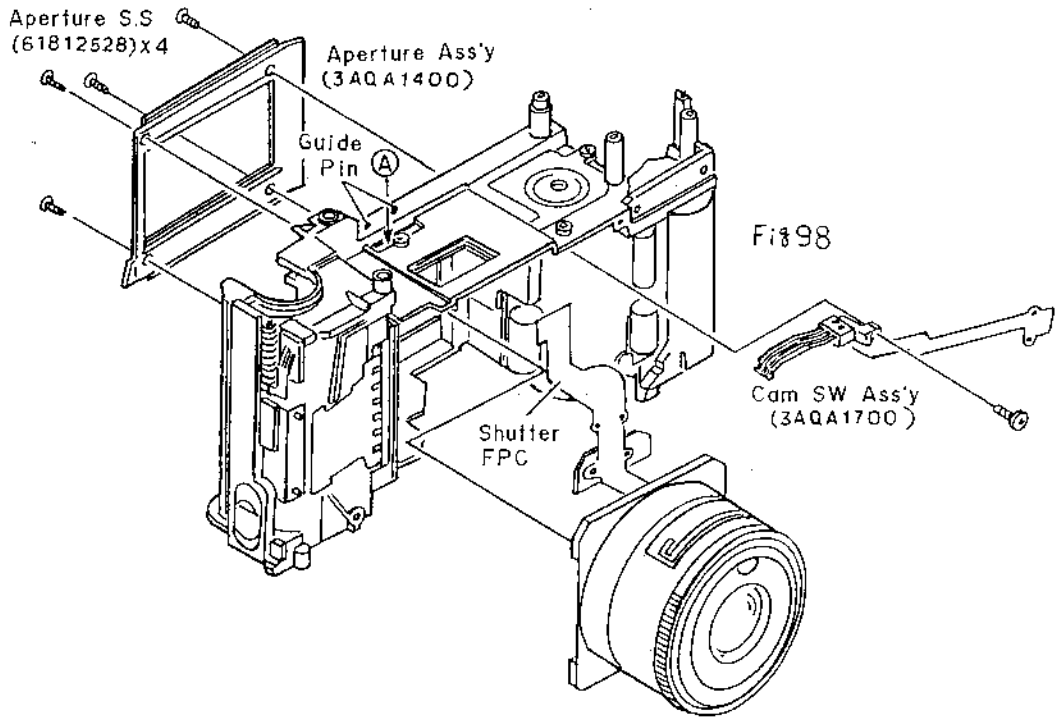



Fig98

6) Install the Barrier Base Plate Ass'y (3AQA6700) into the Body in such a way that the Barrier Lever Pin enters the Cam Groove Hole.
7) Position the boss of the Body in the center of the hole in the Barrier Base Plate, and provisionally tighten the Barrir Base Plate Setscrews (69112566) X 2.
8) Engage the Barrier Lever Spring (3AQ23000) with the Barrier Lever.

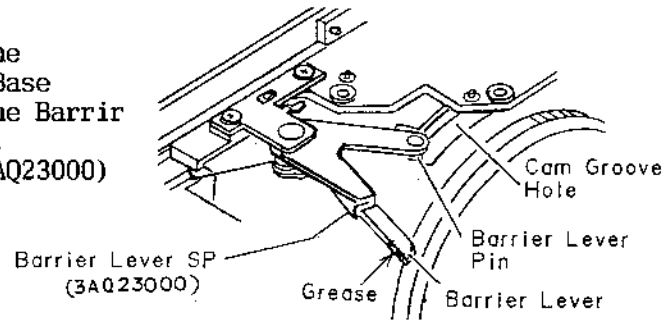



Fig 99

9) Install the MM Base Plate (Upper) Ass'y (3AQA1610) in the Body, and set it by tightening the MM Base Plate (Upper) Setscrews (69112566) X 2. Engage the Barrier Lever Spring with the MM Base Plate (Upper).
10) Install the AF Front Plate Ass'y (3AQA1400) in the Body, and secure it by tightening the AF Front Plate Setscrews (69114076) X 2, (69112566) X 2. (See Fig.24)

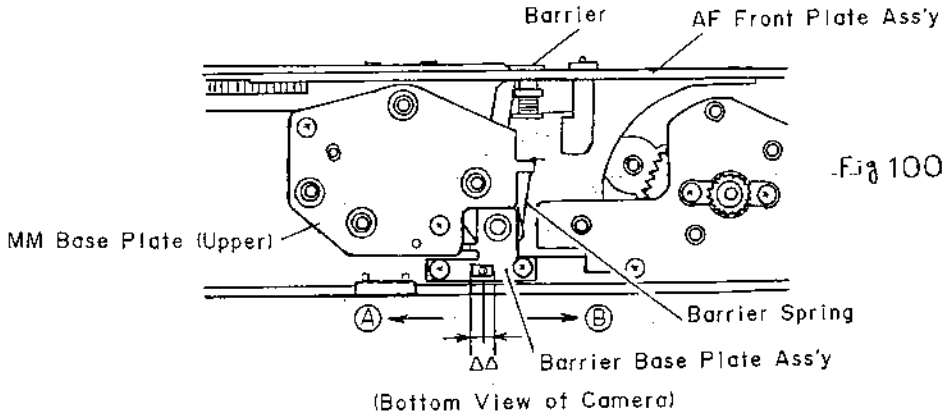



Fig 100

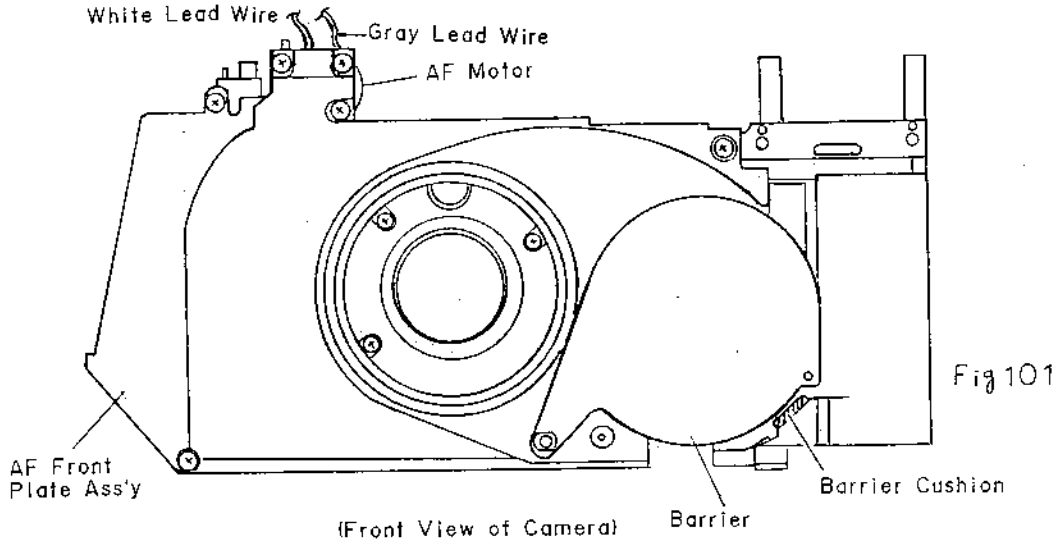



Fig 101

11)Set the regulated DC power supply to 3V.
12)Connect the Gray Lead Wire of the AF Moter to the ⊕ termimal of the regulated DC power supply.
Connect the White Lead Wire of the AF Motor to the ⊖ terminal of the regulated DC power supply and open the Barrier.
13)Adjust the Barrier so that it is in contact with the Barrier Cushion without undue force working.

[How to adjust (See Bottom View of camera of Fig.100)]

a)Move the Barrier Base Plate Ass'y in the Ⓐ direction when "barrier open " is large.
b)Move the Barrier Base Plate Ass'y in the Ⓑ direction when "barrier open " is small.
c)Tighten up the Barrier Base Plate Setscrews.

14)On completion of adjustment,apply Cemedine 551 to the heads of Barrier Base Plate Setscrews.

**Note:**
**a) Take care that the Cemedine does not stick to the MM Gear 6 and MM Gear 7.**

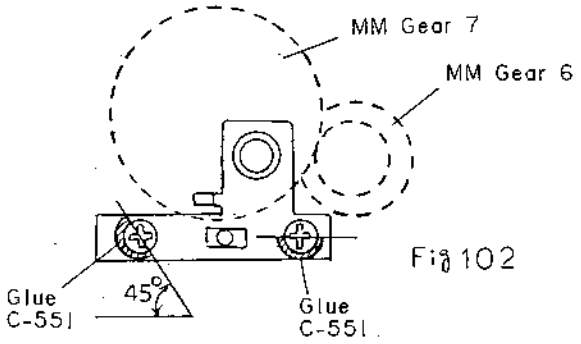


Fig 102

[Installation of Old MM Base Plate (Upper) Ass'y]

a)Install so that the Boss of the Body comes to the center of the slot in the MM Base Plate (Upper).

* In the case of the Old MM Base Plate (Upper) Ass'y, the Barrier Lever must be bent for adjustment. Yet,adjust in such a way that the Barrier still closes.

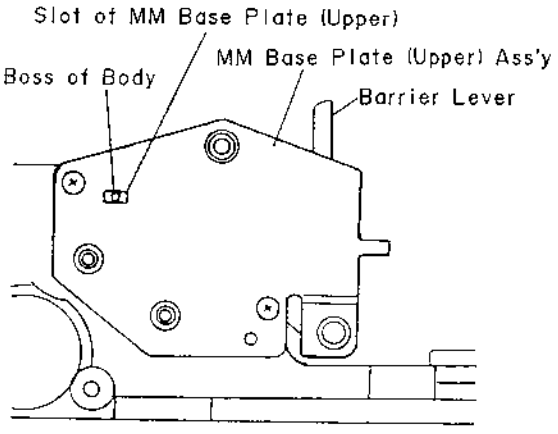


Fig 103

In repairing,remember that there is not necessarily interchangeability between the new and the old parts.

Table of interchangeability

| | New Body | New MM Base Plate (Upper) Ass'y (3AQA1610) | New MM Base Plate (Lower) Ass'y (3AQA1210) | Barrier Base Plate Ass'y (3AQA6700) |
|---|---|---|---|---|
| Old Body | – | × | ○ | × |
| Old MM Base Plate (Upper) Ass'y (3AQA1600) | × | – | ○ | × |
| Old MM Base Plate (Lower) Ass'y (3AQA1200) | △ | △ | – | △ |
| Barrier Base Plate Ass'y (3AQA6700) | ○ | ○ | ○ | – |

○:Interchangeable △:Usable,but not adjustable after installation
×:Not interchangeable

## C-3-4 Modification of FPCs

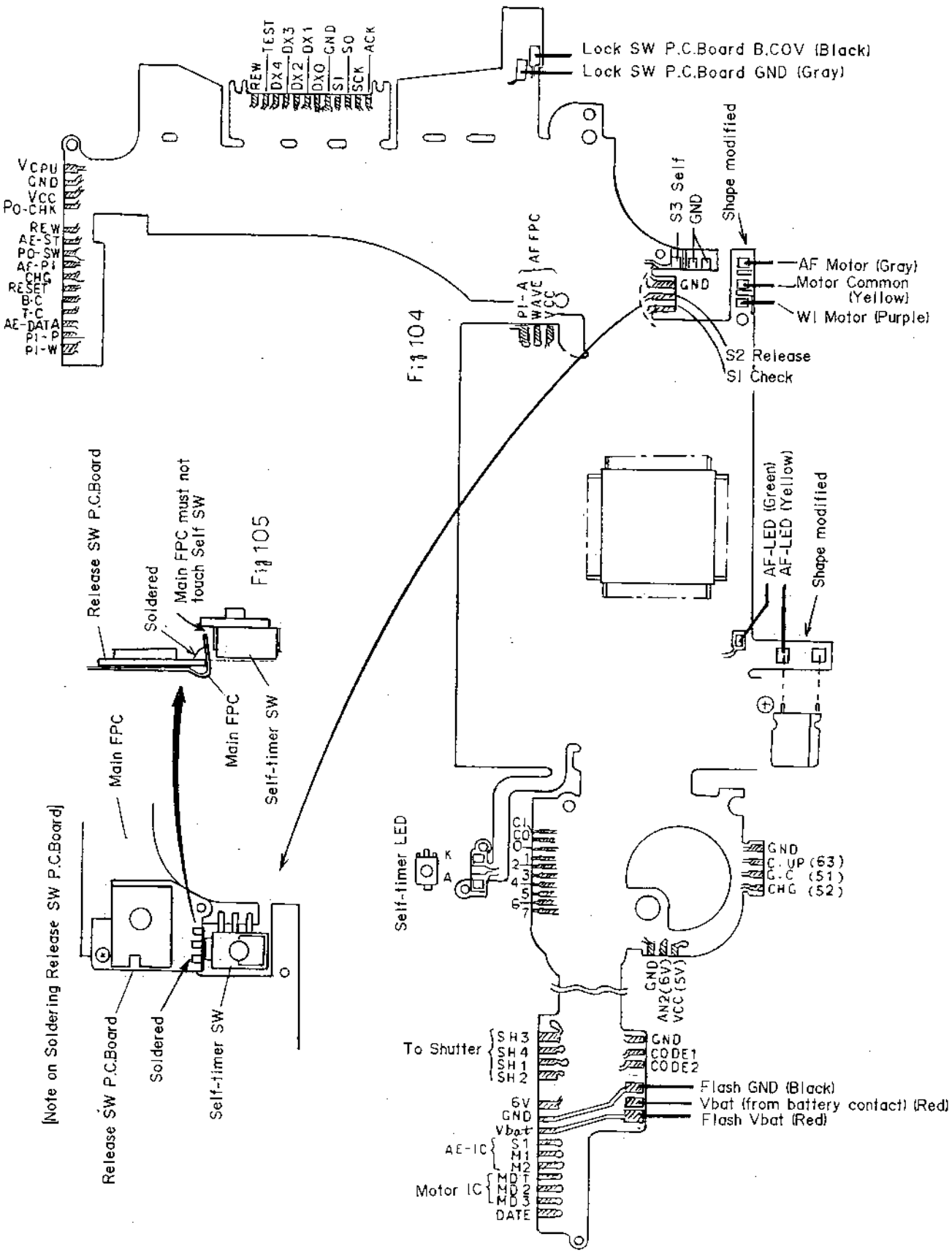
*The shapes of the Main FPC,Sub FPC,AF-FPC,DX-FPC and Release Switch P.C.Board have bean modified.
Since there is no interchangeability between the new and the old of thrse parts,replace the Main FPC Ass'y,Sub FPC Ass'y,Viewfinder Ass'y and DX-FPC all at once in your repair.

Table of interchangeability

| | New Main FPC Ass'y (3AQA0610) | New Sub FPC Ass'y (3AQA0710) | New Viewfinder Ass'y (3AQA2310) | New DX-FPC (3AQ50410) | New Release SW P.C.Board(3AQA6410) |
|---|---|---|---|---|---|
| Old Main FPC Ass'y (3AQA0600) | – | × | × | × | △ |
| Old Sub FPC Ass'y (3AQA0700) | × | – | × | ⊗ | ○ |
| Old Viewfinder Ass'y (3AQA2300) | ⊗ | × | – | ⊗ | ○ |
| Old DX-FPC (3AQ50400) | × | ⊗ | ⊗ | – | ○ |
| Old Release SW P.C. Board (3AQA6400) | △ | ○ | ○ | ○ | – |

○:Interchangeable △:Usable if lead is used
×:Not interchangeable ⊗:Not usable as a whole,though usable alone

**Main FPC Ass'y-----Shape modified**



**Sub FPC Ass'y** -----Constant-voltage (IC202) has been disued

Old Sub FPC Ass'y ⟹ New Sub FPC Ass'y
(3AQA0700) (3AQA0710)

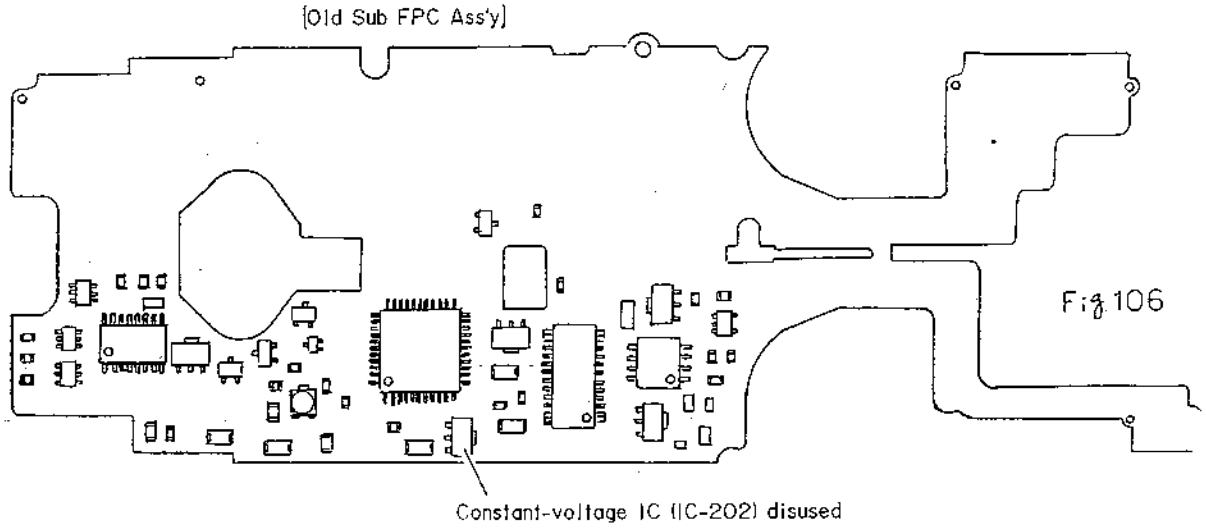



Fig 106

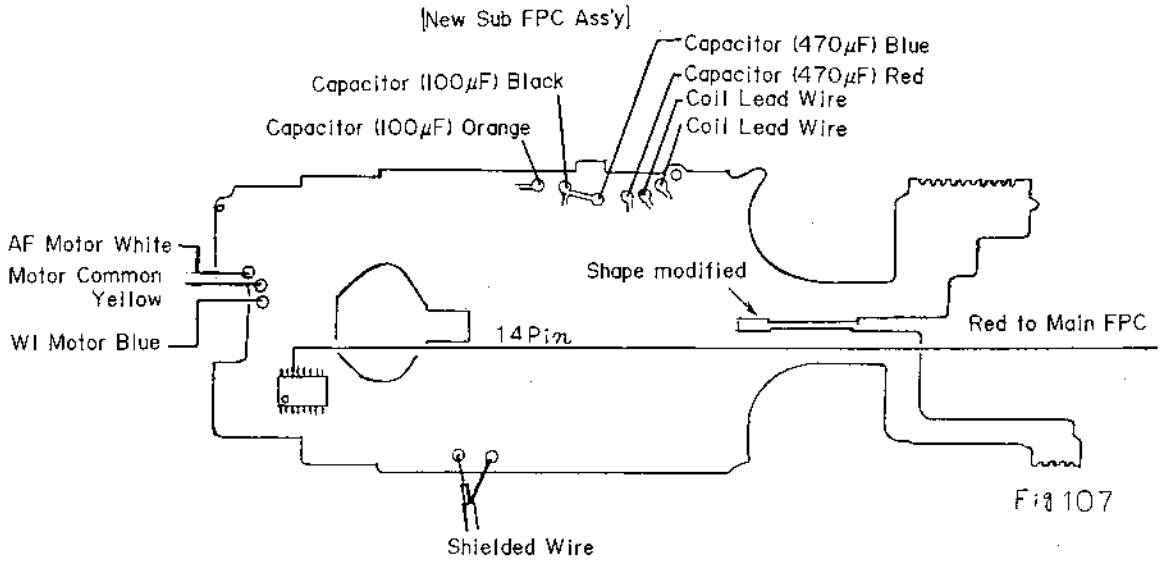



Fig 107

**Viewfinder Ass'y**----- Constant-voltage IC(IC-302) added to AF-FPC

Old Viewfinder Unit Ass'y ⟹ New Viewfinder Unit Ass'y
(3AQA2300) (3AQA2310)

* Position adjustment of PSD requires use of a special measuring device, so that replacement of AF-FPC alone cannot be made. Replace the Viewfinder Unit Ass'y.

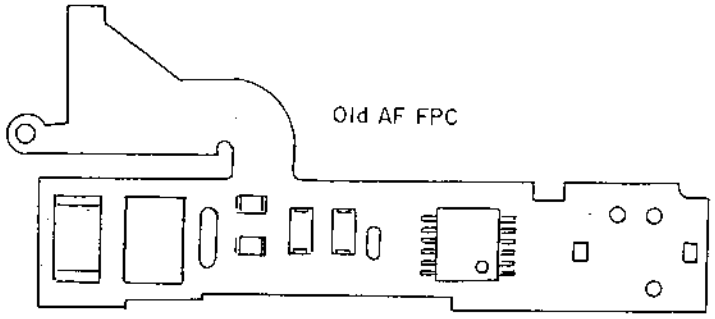



Fig 108

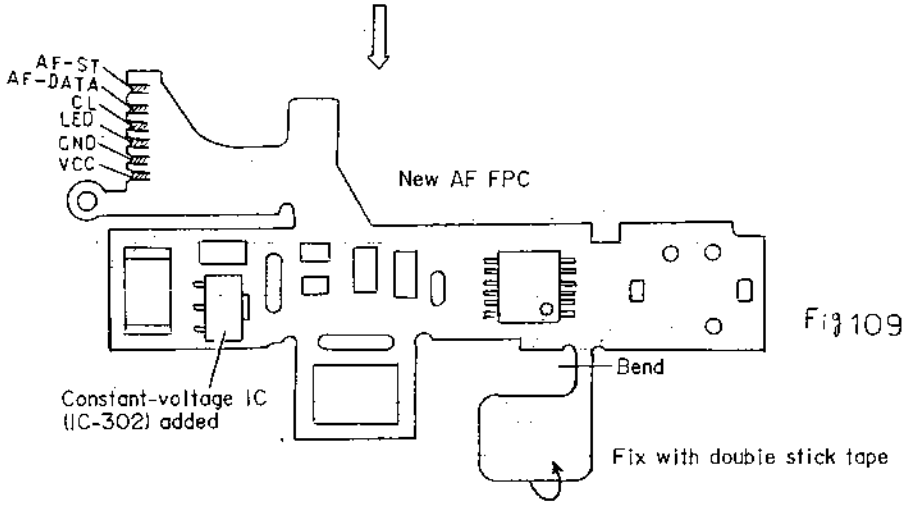



Fig 109

○**DX FPC** ------- Soldering land position modified

Old DX FPC (3AQ50400) ⇨ New DX FPC/Old DX Case Ass'y (3AQ50401) (3AQA2200) ⇨ New DX Case Ass'y (3AQA2210)

* With the change in the soldering joint position of the DX FPC, the soldering joint position of the Main FPC is dislocated. As a result, there is no interchangeability between the old and new parts.

○**Release Switch P.C.Board** -------- Pattern changed

Old Release SW P.C.Board Ass'y (3AQA6400) ⇨ New Release SW P.C.Board Ass'y (3AQA6410)

*The New Release Switch P.C.Board Ass'y must be soldered directly to the New Main FPC.

○Shutter FPC ---- Orange lead wire soldering position changed

* The soldering position of the Orange Lead Wire in the Lens Barrel Ass'y is different between the New and Old Main FPCs.
The New Shutter FPC has a rand specifically for soldering the Orange Lead Wire.

Old Lens Barrel Ass'y (3AQA1800) ⇨ New Lens Barrel Ass'y (3AQA1810)

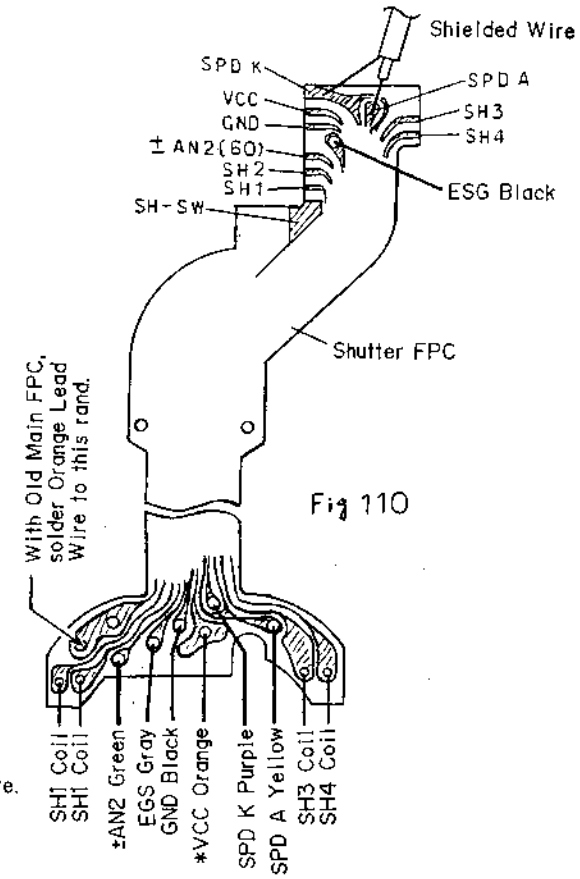



Fig 110

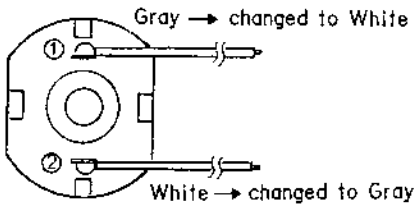
*With New Main CPU, solder Orange Lead Wire.

○AF Motor Ass'y----Lead Wires of AF Motor reversed

Old AF Motor Ass'y (3AQA4500) ⇨ New AF Motor Ass'y (3AQA4510)

AF Motor ① pin:Gray Lead Wire 150mm ⟶ ① pin :White Lead Wire 125mm
AF Motor ② pin:White Lead Wire 150mm ⟶ ② pin :Gray Lead Wire 30mm

* Remember that the colors of the Lead Wires of the AF Motor are reversed. Therefore exchange Lead Wires and use then.




○AF Front Plate Ass'y --------Lead Wires of the AF Motor reversed

Old AF Front Plate Ass'y (3AQA1400) ⇨ New AF Front Plate Ass'y (3AQA1410)

C -3-5 Forming Lead Wires New FPC

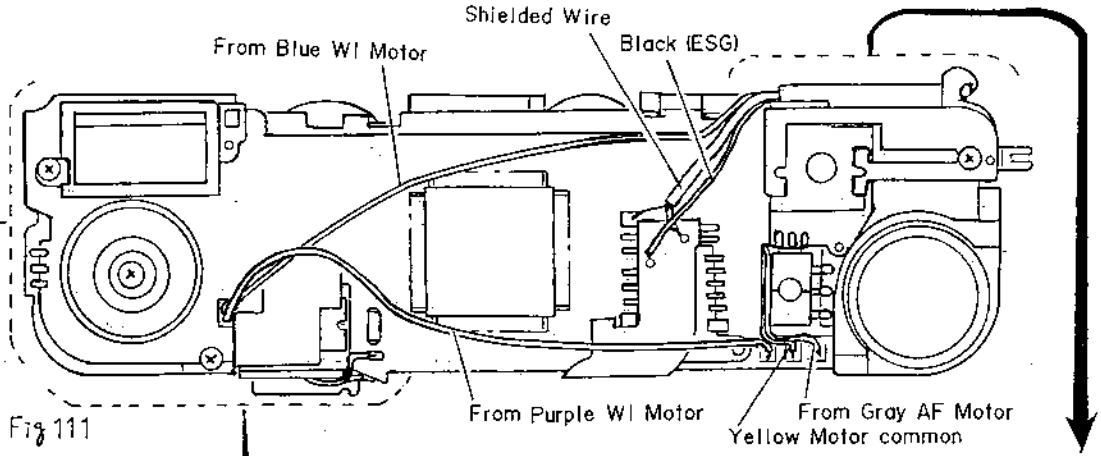



Fig 111

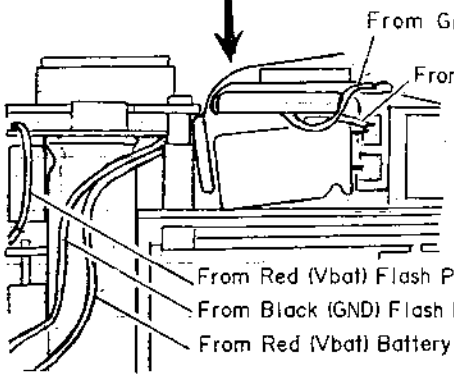

From Green AF LED
From Yellow AF LED
From Red (Vbat) Flash P.C.Board
From Black (GND) Flash P.C.Board
From Red (Vbat) Battery Contact

Fig 112

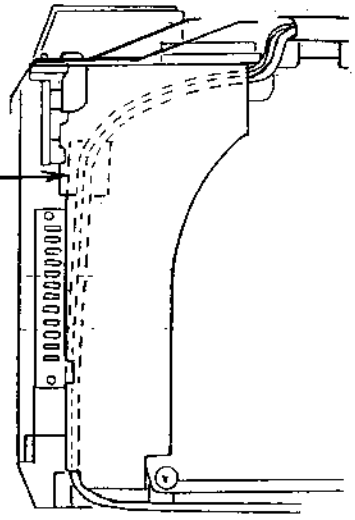



Fig 113

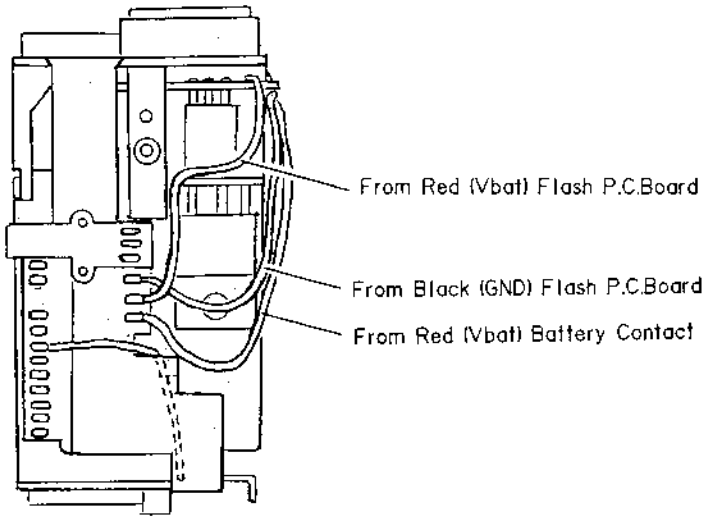



Fig 114

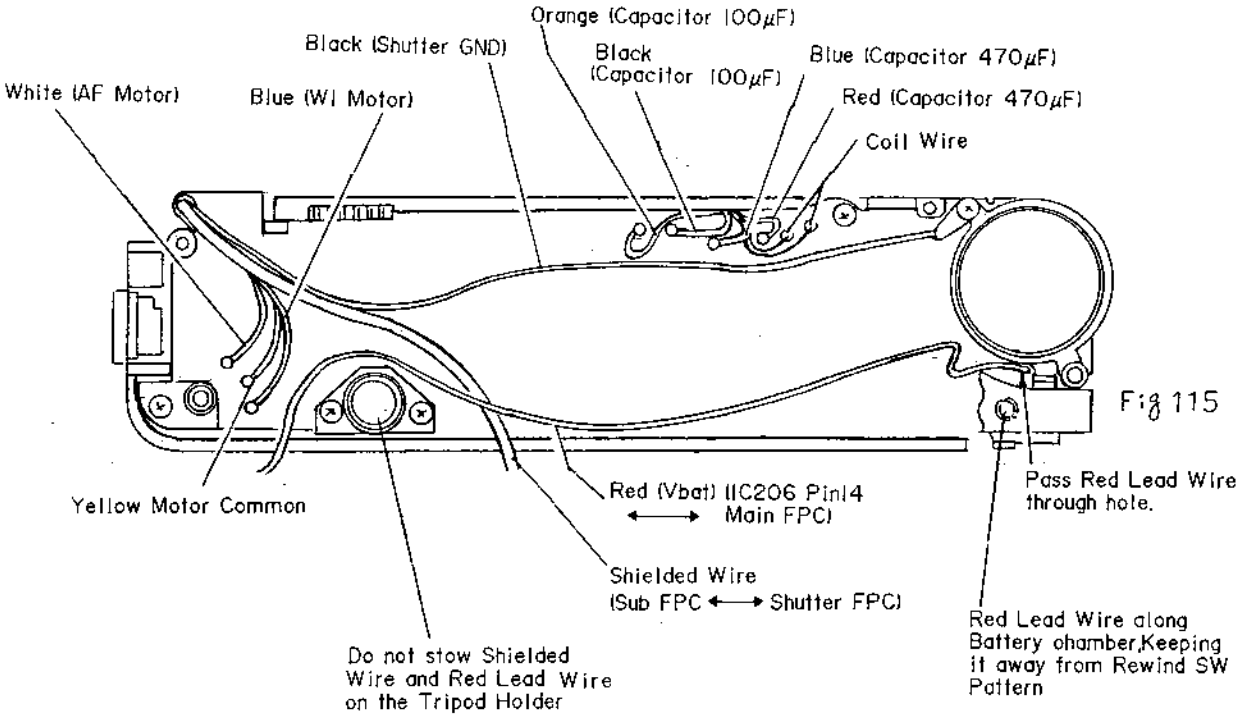

Orange (Capacitor 100μF)
Black (Shutter GND)
Black (Capacitor 100μF)
Blue (Capacitor 470μF)
Red (Capacitor 470μF)
White (AF Motor)
Blue (W) Motor)
Coil Wire
Yellow Motor Common
Red (Vbat) (IC206 Pin14 ⟷ Main FPC)
Shielded Wire (Sub FPC ⟷ Shutter FPC)
Pass Red Lead Wire through hole.
Red Lead Wire along Battery chamber, Keeping it away from Rewind SW Pattern
Do not stow Shielded Wire and Red Lead Wire on the Tripod Holder

Fig 115

[Note on Stowing AF Lead Wire ⊕ ]

As a result of modification of the Main FPC and AF-FPC, the length of the Yellow Lead Wire (AF ⊕ ) attached to the Viewfinder Unit has changed (from 66mm to 35mm). When you use the Old Lead Wire (66mm) With the New AF-FPC, exercise special care for the forming of the Lead Wire.
Do not place the Lead Wire on the AF-LED, and also take care that the Lead Wire not pinch between the Capacitor and AF-LED.

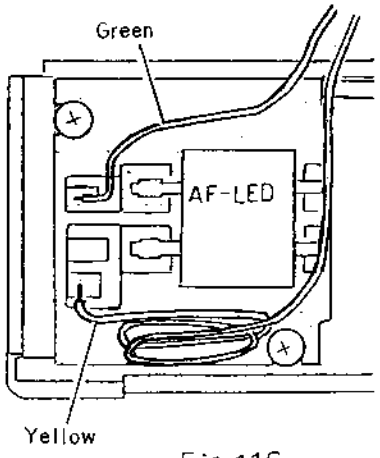



Fig 116

## C-4 Adjustments and Others

### C-4-1 Viewfinder LED Position Adjustment

1)Solder the Lead Wire to the pattern of COM of the LED FPC (See Fig.118).
2)Set the voltage of the Regulated DC Power Supply to 1.7 to 1.8V.
3)Connect the ⊕ terminal of the Regulated DC Power Supply to the Lead Wire (COM).
4)Connect the ⊖ terminal of the Regulated DC Power Supply to the 500,125,30,LT terminal of the LED FPC.
5)Loosen the Viewfinder LED Setscrew (69215066) and adjust the Viewfinder LED so that,as you look into the center of the Viewfinder,the outer frames within the Viewfinder come in contact with "5","3" and "L".
6)Tighten up the Viewfinder LED Setscrew.
7)After the adjustment,fix by applying the glue (Cemedine 551) in three positions.

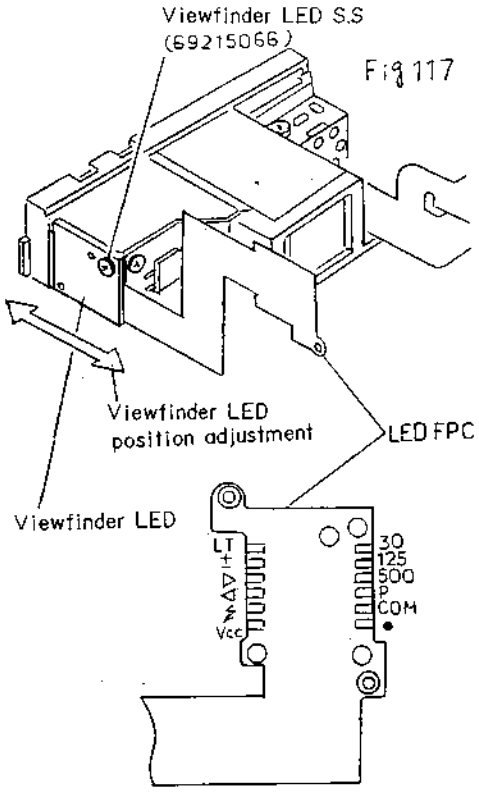


Fig 117

Fig 118

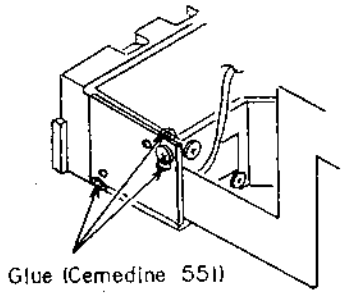
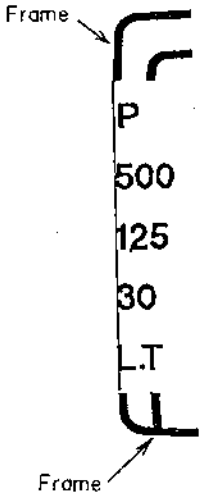


Fig 120



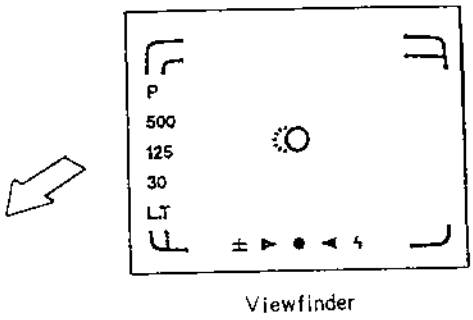



Fig 119

C-4-2 Reference Voltage Adjustment

VR-VS=360 5mv (Ta=25°C)

1)Set the Regulated DC Power Supply to 3V.
2)Connect the ⊕ and ⊖ connector of the Rrgulated DC Power Supply to the power supply of the camera.
3)Connect the ⊕ terminal of the multimeter to VR (TP131) and the ⊖ terminal to VS (TP129).
4)Half-press the Release Switch (PH ⟶ ON).
5)Adjust the voltage indicated on the multimeter to 360±5mv by the veriable resister (VR201).

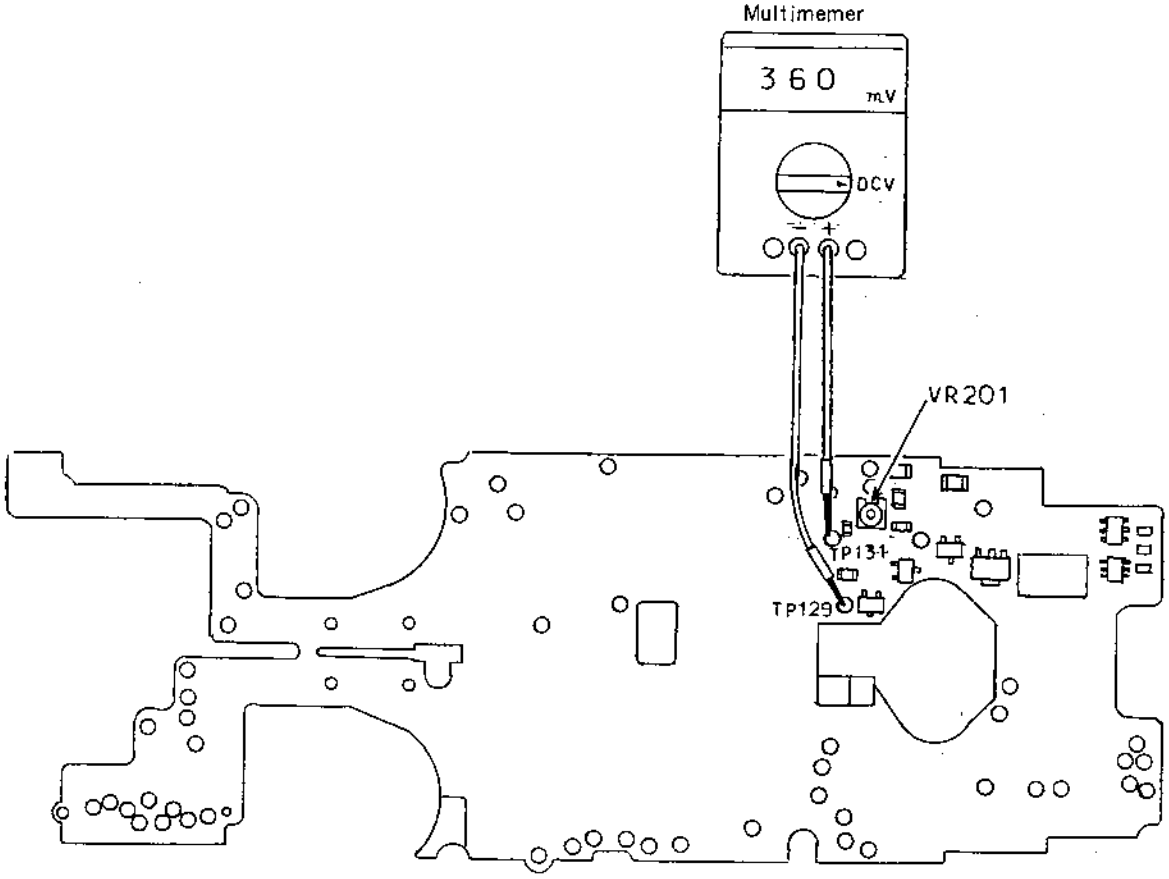
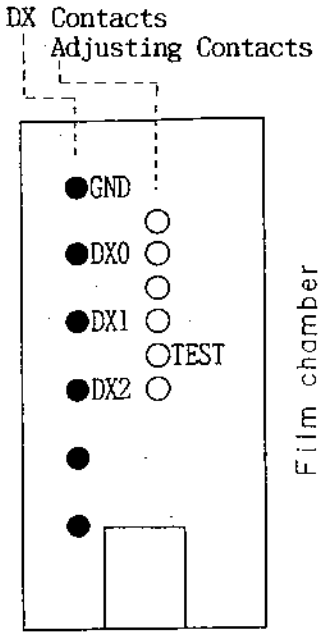



Fig 120

## C-4-3 Adjustments of Compensation Values

### 1.Adjustments in manual adjusting mode and DX contacts

| Adjustments | DX Contacts | | |
|---|---|---|---|
| | DX2 | DX1 | DX0 |
| Dial setting A-D converted value display mode | 1 | 0 | 0 |
| AF data display mode | 1 | 1 | 0 |
| Light metering value display mode | 1 | 0 | 1 |
| Compensation value correction mode | 1 | 1 | 1 |




### 2.How to use manual adjusting tool

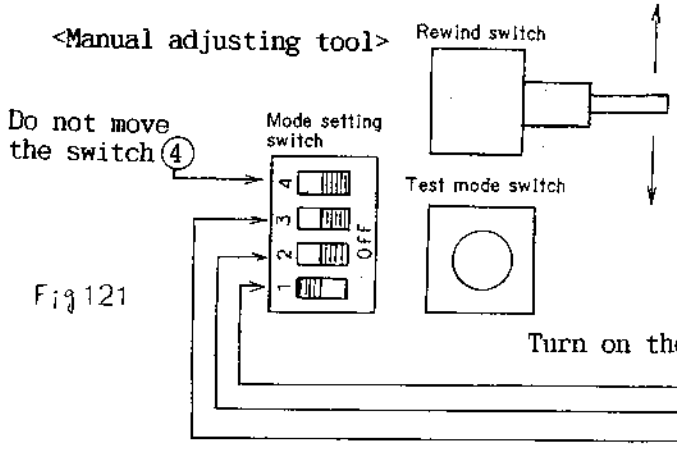
① Peel off the Explanation Seal (38411900).

② Insert the manual adjusting tool in the film chamber.

*Be sure to insert the manual adjusting tool properly so that the DX Contacts and the test pins come in contact.

*"1"---- Mode setting switch OFF
"0"---- Mode setting switch ON

<Manual adjusting tool>




Rewind switch ON (set the switch in this position when data are to be stored inmemory. And turn OFF power.

Usually keep the switch in the center position.

Rewind switch ON (Set the switch in this position FL,SL,HL or tP data are to be checked.)

Do not move the switch ④

Fig 121

Turn on the test mode switch.

| | ③ DX2 | ② DX1 | ① DX0 |
|---|---|---|---|
| Dial setting A-D converted value display mode | 1 | 0 | 0 |
| AF data display mode | 1 | 1 | 0 |
| Light metering value display mode | 1 | 0 | 1 |
| Compensation value correction mode | 1 | 1 | 1 |

3.Seting of adjusting mode

With the Focus Dial in a position other than "OFF",set the DX Contacts as spcifed above and turn the leel at the Test Contact to "L".
Once any desiled mode has been set,the mode is maintained irrespective of the state of the DX Contacts and Test Contact.

4.Cancellatiou of adjusting mode

Set the Focus Dial in the "OFF" position to cancel any selected manual adjusting mode.

5.Operation in adjusting mode

(1)Dial setting A-D converted value display mode

① When this mode is set, the LCD displays 「FL」 and 「data」 are blinking alternately. 「FL」 means that the value of the focus dial seeting is now under A-D conversion.
The data displayed is the A-D converted value.

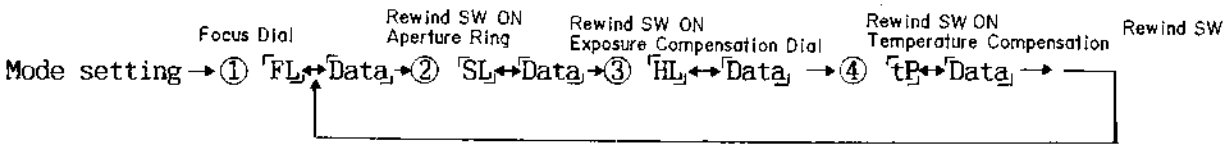
② When the rewind switch is turned ON, the LCD displays 「SL」 and 「data」 are blinking alternately. The data displayed is the A-D converted value of the Aperture Ring setting.

③ When the rewind switch is turned ON, again the LCD displays 「HL」 and 「data」 are blinking alternately. The data displayed is the A-D converted value of the Exposure Compensation Dial setting.

④ When the rewind switch is turned ON once more, the LCD displays 「tP」 and 「data」 are blinking alternately. The data displayed is the AF-IC output corrected by temperature compensation and then A-D converted.

⑤ When the rewind switch is turned ON once more again, the display returns to ① .

⑥ Dial setting A-D converted value display mode is canceled when the Focus Dial is set to "OFF" in any state of ① to ④ above.




(2)AF data display mode

① The camera perfoms distance metering at intervals of 500ms. The LCD display the AF-IC output value in the form of $00 to $FF (HEX).
The value displayed varies with the position of the self select switch as follows.

Self select switch OFF: Raw data from AF-IC
Self select switch ON : Data from AF-IC corrected by temprature compensation

② When the release switch is turned ON,the lens barrel advances according to the result of distamce metering and the shutter operates.

③Even after shutter operation, the LCD continues to display the AF-IC output at the shutter operation.

④When the check switch is turned ON, the display returns to ①.

⑤AF data display mode is canceled when the Focus Dial is set to "OFF".

**(3)Light metering data display mode**

①The camera performs light metering at intervals of 500ms.
The LCD display the raw data of light metering in a value of $00 to $90.
②When the release switch is turned ON, the shutter operates according to the result of light metering.
The shutter operation varies with the position of the self select switch as follows.

Self serect switch OFF: The shutter operates according to the light metering data.
Self serect switch ON : Irrespective of the light metering data, the shutter operates at the maximum speed equivalent to EV17 (1/500).

③Even after shutter operetion, the LCD continnes to display the raw data of light metering at the shutter operation.

④When the check switch is turned ON, the display returns to ①.

⑤Light metering display mode is canceled when the Focus Dial is set to "OFF".

**(4)Compensation value correction mode**

①When this mode is set, the LCD displays 「1C」 or 「88」 and 「data」 are blinking alternately.
The number following the " ◁ " mark represens as address of the CPU. (Lower 8 bits)

**Data change**: a)Set the Exposure Compensation Dial to be a position other than "0".
b)After a), turn ON the check switch, and the 「data」 will be changed according to the setting of the Exposure Compensation Dial. (Auto change in 1/8sec.)

Setting of Exposure Compensation Dial +0.5 to +2.0: 「Data」+1
-0.5 to -2.0: 「Data」-1

**Adress change**:a)Change the Focus Dial position from "AF"to "∞"or from "∞" to "AF" the numrer in the lower position of the address will be increased by two and the LCD will display the new address and data are blinking alternately.
Change the self select switch position, and the number in the higher position of the address will be increased by one and the LCD will display the new address and data are blinking alternately.

②When the Focus Dial is set to "OFF", the CPU calculates the inclination and intercept of the AF linear function and the A-D converted values of the Exposure Compensation Dial, Aperture Ring and Focus Dial settings and enters then togeter with the changed data in EEPROM. (Before setting the Focus Dial to "OFF", make sure that the rewind switch is turned ON.)

Example:When correction value of light metering (address $20) is to be changed to "$08"

| | Operation | LCD display | Meaning of display |
|---|---|---|---|
| ① | Short TEST contact to GND and set manual correction mode. | LCD displays "88" and "BC" are blinking alternately. | Data of address "$88" is "$BC". |
| ② | Change Forcus Dial position from "AF" to "∞". | LCD displays "8A" and "CC" are blinking alternately. (Next address) | Data of address "$8A" is "$CC". |
| ③ | Change Forcus Dial position from "∞" to "AF". | LCD displays "8C" and "DC" are blinking alternately. (Next address) | Data of address "$8C" is "$DC". |
| ④ | Set address "$90" by repeating ② and ③. | LCD displays "90" and "36" are blinking alternately. | Data of address "$90" is "$36". |
| ⑤ | Set self select switch from "OFF" to "ON". | LCD displays "A0" and "8C" are blinking alternately. (Address is increased by $10.) | Data of address "$A0" is "$8C". |
| ⑥ | Set self select switch from "ON" to "OFF" | LCD displays "B0" and "00" are blinking alternately. (Address is increased by $10.) | Date of address "$20" is "$00" |
| ⑦ | Set address "$20" by Repeating ⑤ and ⑥ | LCD displays "20" and "00" are blinking alternately | Data of address "$20" is $00". |
| ⑧ | Set Exposure Compensation Dial to "+" side and turn ON check switch. | LCD displays data only. with check switch ON, data is increased one by one. "00"-----"01"---Displayed | Data of address "$20" changes from $00 to "$01"and so on. |
| ⑨ | When data becomes "$08", turn OFF check switch. | LCD displays "08". | Data of address "$20" is "$08". |
| ⑩ | With rewind switch turn ON, set Focus Dial to OFF. | System return to normal mode, with LCD displaying "00". | Manual correction has been complered. |

**Note: When the data is to be increased by one, turn ON the check switch and then OFF immediately. If the check switch is not released immediately, the data exceeds your desired value quickly. In such a case, set the Exposure Compensation Dial to the "−" side and turn ON the check switch for subtraction.**

**After correction, be sure to turn ON the rewind switch before setting the Focus Dial to OFF. If the rewind switch is not turned ON, the data is not written in EEPROM.**

## 6.Manual adjustment procedure

Write the variables of the backup data in the EEPROM by the following procedure. (For constants,write the designed values.)

**(1)AE adjustment** (Shutter delay compensation and light metering compensation)
AE adjustment includes shutter delay adjustment and light metering adjustment. Make the shutter delay adjustment first and then the light metering adjustment.
Before starting the AE adjustment,clear the correction values of light metering (address $20) and chutter delay (address $22) to "00" in the compensation value correction mode. Also set the Exposure Compensation Dial to "0" and the Apreture Ring to F2.8.

**① Shutter delay adjustment** (address of correction value:$22)

In the rise compensation of the shutter,change per step is 100μs(about 0.25EV) and the correction value is expressed in two's complement of four bits. There are 16 steps of -8 to +7.

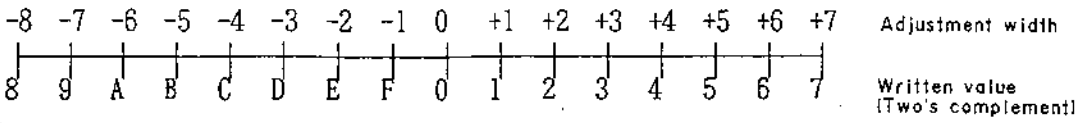
1)Set the mode setting switchs of the manual adjusting tool:
No.1 : OFF, : No.2 : ON, : No.3 : OFF
2)Turn ON the Main Switch of the camera and set the manual adjusting tool in the camera.
3)Turn ON the test mode switch of the manual adjusting tool to set the light metering value display mode.
(Change brightness and make sure that the light metering value displayed on the LCD change.)
4)Turn ON the self select switch and press the release button,and the shutter will operate at 1/500 (EV17),irrespective of light metereing value.
5)Set the AE tester to EV17 (EV15) and release the shutter.
6)Find a correction value from the error in exposure value and set the Focus Dial to OFF to cancel the light metering value display mode. Then write the correction value in the manual correction
(When the AE tester is set to EV15,set the AE tester to ISO 400).

Correction value = Current correction value - (Error in exposure value /0.25)

7)Repeat 5) and 6) until the average of five successive correction values becomes within 0.3EV.
(The change per step varies considerably with shutters. In other words, 0.25EV is the value given for reference only.)

Example: When the error in exposure value is +1EV at seting to EV17

As mentioned above,the EV change per step is about 0.25EV. Therefore, if the current correction value is "0",and in case the correction value shows -4 after the calculation according to the above formula, please write "C".




**Note: Written values are expressed in two's complements as shown above. Although each data is displayed in two bytes,you can neglect the upper one byte.**

Example: When the data displayed is "32", only "2" is significant.

**[Mechanical adjustment in case of shutter delay adjustment failure]**

* If the shutter delay adjustment is not achieved by the above-mentioned procedure (-3.0 to -1.5EV), adjust the shutter unit mechanically to set a proper delay.

**(Preparation)**

1)Set the Aperture Ring to the flash mode "↯".
2)Set the Focus Dial to the marking "0.7m".
3)Open the back cover and release the shutter. At this point,check to see if the FM aperture is approximately equivalent to F11. (Adjustment is required if the FM aperture is a pinhole.)

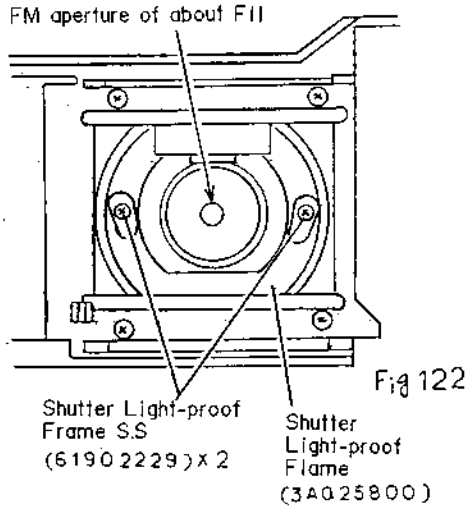


Fig 122

**(Adjustment)**

1)Set the Focus Dial to the marking "0.7"
2)Press the shutter button. After shutter operation,remove the battery before the return of the lens barrel.
3)Remove the shutter Light-proof Frame Setscrew (61902229)×2 and take off the shutter Light-proof Frame (3AQ25800).
4)Adjust the FM aperture by turning the shutter trigger pin.
5)Insert the battery and check the FM aperture.
6)Perform the shutter delay adjustment (address of correction value : $22).
7)Install the shutter Light-proof Frame.

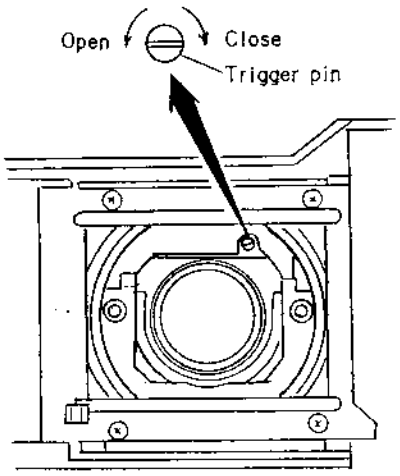


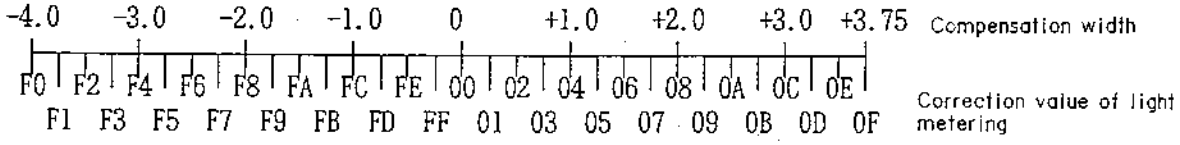
Fig 123

② **Light metering adjustment** (address of correction value : $20)

Correction value is calculated from the automatic exposure including the errors in light metering value and shutter operation. The correction value is used to correct the light metering value. The correction value is expressed in two's complment of five bits. Change per step is 0.25EV. There are 32 steps of -4.0EV to +3.75EV.

1)After completion of the shutter delay adjustment,set the AE tester to EV15 and release the shutter the normal way. Then read the error in exposure.
2)Do the same and read the errors in EV8 and EV10.
3)From these errors,determine a correction value so that all the errors will be within ±0.3 EV and write it in the manual correction mode. (Average of five successive correction values)

Example: When the error in EV8 is -0.7EV and that in EV15 is -0.5EV
Change per step is 0.25EV. Therefore,if the current corrective value is "FF",and two to it and write the summation,"01".After that,make sure that the error in EV10 is ±0.3EV.


-4.0 -3.0 -2.0 -1.0 0 +1.0 +2.0 +3.0 +3.75
Compensation width
F0 F2 F4 F6 F8 FA FC FE 00 02 04 06 08 0A 0C 0E
F1 F3 F5 F7 F9 FB FD FF 01 03 05 07 09 0B 0D 0F
Correction value of light metering

**Note: Written values are expressed in two's complements as shown above.**

**(2) AF adjustment** (AF adjustment and F/B adjustment)

① **AF adjustment** (addresses of correction values : $32, 34, 36 and 38)
This AF system operates based on the raw data of AF-IC output pulses at four points. Therefore,the system uses the raw data as correction values.

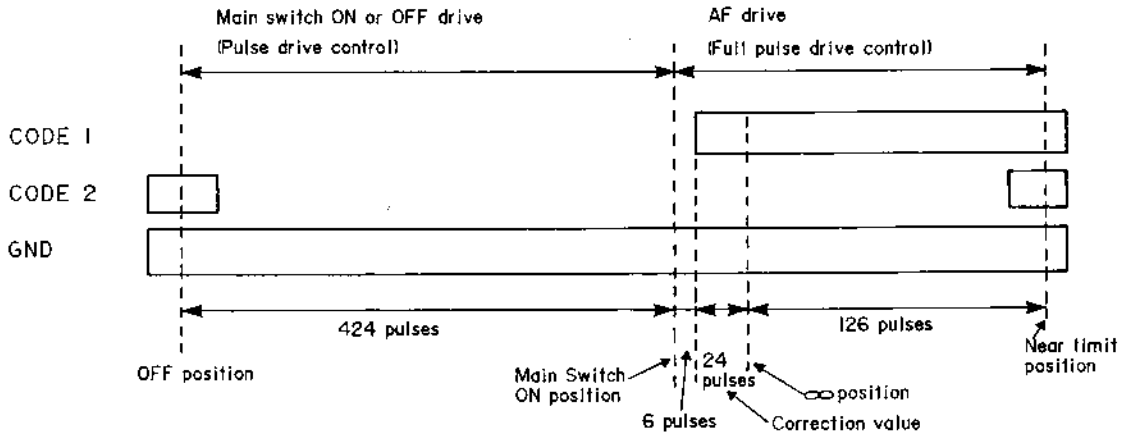
1) Set the mode setting switches of manual adjusting tool:
No.1 : ON, No.2 : ON, No.3 : OFF
2) Turn ON the Main Switch of the camera and set the manual adjusting tool in the camera.
3) Turn ON the test mode switch of the manual adjusting tool to set the A-D converted value display mode.
4) Turn ON the rewind switch three times,and the LCD will display "tP" and "DATA" are blinking alternately. Then read the value "DATA". (AF-IC temperature compensation value)
5) Set the Focus Dial to "OFF" to cancel this mode. After that,write the above value at address $58 in the compensation value correction mode and then set the Focus Dial to "OFF".
6) Set the mode setting switches of the manual adjusting tool:
No.1 : ON, No.2 : OFF, No.3 : OFF
7) Turn ON the Main Switch of the camera and set the manual adjusting tool in the camera.
8) Turn ON the test mode switch of the manual adjusting tool to set the AF data display mode.
(Make sure that the distance metering value displayed on the LCD varies with distance.)

9) Turn ON the self select switch. (The data is corrected by temperature compensation.)
10) In an environment free from any effect of external light, place a standard reflector chart in parallel at a distance of 5m from the film surface of the camera. Then read the value displayed on the LCD.
11) Do the same and read the data for 1.67m, 1.0m and 0.71m.
12) Write these values in the compensation value correction mode.

Adress

S32 ------ Distance metering data for 5.0m
S34 ------ " 1.67m
S36 ------ " 1.0m
S38 ------ " 0.71m

13) With the rewinding switch turned ON set the Focus Dial to "OFF" to cancel the manual correction mode. The CPU inside the camera executes arithmetic operations automatically.




* 24pulses: Make AF adjustment with the true infinity position as the correction value.
* 126pulses: Focusing range

[AF check procedure]

1) Place the camera body at a distance of 0.71m from the gray chart.
2) Turn the Focus Dial and make sure that the focus indicator " ● " inside the viewfinder light up at the 0.7m position of the Focus Dial.
3) Set the camera body at a distance of 2m from the chart.
4) Turn the Focus Dial and make sure that the focus indicator " ● " inside the viewfinder light up at the 2m position of the Focus Dial.
5) Turn the Focus Dial to the marking "∞".
6) Cover the AE window with black light-proof paper (or moquette) and make sure that the focus indicator " ● " inside the viewfinder light up.

7) If an indicator ( ▶ or ◀ ) other than the focus one light up, perform the adjustment again.

Notes: a)Take care not expose the chart to the rays of the sun.
b)If focusing on 0.70m and 2m is correct but that on infinity is not, the light-proof moquette attached to the AF window may not intercept external light properly. Or check the backup data of the AF unit and EEPROM.

②**F/B adjustment** (pulse count compensation for infinity position) Address of correction value : $5A)

1)With the Main Switch turned ON, open the Back Cover and turn ON the check switch and then the rewind switch. Then the Lens Barrel will advance by a distance equivalent to the pulse count written at address $5A and the shutter will open. (This state will be reset at the next power ON or a similar operation.)
2)Under these conditions,measure the error △Lmm in the infinity position, using a collimator.
3)The lens advance per pulse in AF drive is 0.0183mm. Therefore, caculate the pulse count for the error from the following formula:

△L/0.0183= Pulse count for error

4)Check the data of $5A in the compensation value correction mode.
Then increase or decrease the data by the pulse count for error and write the resultant value.
When the data is incresed,the lens advance increases.
5)Again open the Back Cover, turn ON the check switch and the rewind switch and check the error using the collimator.

○Use an auto collimator of F=193.5mm.
○Reference value : +3.0±1.0mm (Use a reference mirror stand.)

*For △L, see the table on the next page.

*If F/B adjustment is not achieved by pulse count compensation, make adjustment by replacing the lens F.B adjusting washer. (See Page C-3 and C-4)

Example : If the lens collimator indicates a minus value with the pulse count correction value changed to "00", replace the thick lens F.B adjusting washer with a thin one and rewrite the pulse count again.

## Difference between film surface and focal plane

| D \ f | 5 mm | 6 | 6.5 | 7 | 8 | 9 | 35 | 38 | 40 | 45 | 50 | 55 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm 0.1 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0002 | 0.0002 | 0.0035 | 0.0039 | 0.0043 | 0.0054 | 0.0067 | 0.0080 |
| 0.2 | 0.0001 | 0.0002 | 0.0002 | 0.0003 | 0.0005 | 0.0004 | 0.0066 | 0.0077 | 0.0086 | 0.0108 | 0.0134 | 0.0161 |
| 0.3 | 0.0002 | 0.0003 | 0.0003 | 0.0004 | 0.0005 | 0.0007 | 0.0098 | 0.0116 | 0.0128 | 0.0162 | 0.0201 | 0.0243 |
| 0.4 | 0.0003 | 0.0004 | 0.0004 | 0.0005 | 0.0007 | 0.0009 | 0.0131 | 0.0155 | 0.0171 | 0.0217 | 0.0268 | 0.0324 |
| 0.5 | 0.0005 | 0.0005 | 0.0005 | 0.0007 | 0.0009 | 0.0011 | 0.0164 | 0.0193 | 0.0214 | 0.0271 | 0.0335 | 0.0405 |
| 0.6 | 0.0004 | 0.0006 | 0.0007 | 0.0008 | 0.0010 | 0.0013 | 0.0197 | 0.0232 | 0.0257 | 0.0326 | 0.0402 | 0.0486 |
| 0.7 | 0.0005 | 0.0007 | 0.0008 | 0.0009 | 0.0012 | 0.0015 | 0.0230 | 0.0271 | 0.0300 | 0.0380 | 0.0469 | 0.0567 |
| 0.8 | 0.0005 | 0.0008 | 0.0009 | 0.0011 | 0.0014 | 0.0017 | 0.0263 | 0.0310 | 0.0343 | 0.0434 | 0.0536 | 0.0649 |
| 0.9 | 0.0006 | 0.0009 | 0.0010 | 0.0012 | 0.0015 | 0.0020 | 0.0296 | 0.0349 | 0.0386 | 0.0489 | 0.0604 | 0.0730 |
| 1.0 | 0.0007 | 0.0010 | 0.0011 | 0.0013 | 0.0017 | 0.0022 | 0.0329 | 0.0388 | 0.0430 | 0.0544 | 0.0671 | 0.0812 |
| 1.2 | 0.0008 | 0.0012 | 0.0014 | 0.0016 | 0.0021 | 0.0026 | 0.0395 | 0.0466 | 0.0516 | 0.0653 | 0.0806 | 0.0975 |
| 1.4 | 0.0009 | 0.0014 | 0.0016 | 0.0018 | 0.0024 | 0.0031 | 0.0461 | 0.0544 | 0.0603 | 0.0765 | 0.0942 | 0.1139 |
| 1.6 | 0.0011 | 0.0016 | 0.0018 | 0.0021 | 0.0028 | 0.0035 | 0.0528 | 0.0622 | 0.0689 | 0.0873 | 0.1077 | 0.1303 |
| 1.8 | 0.0012 | 0.0017 | 0.0020 | 0.0024 | 0.0031 | 0.0039 | 0.0594 | 0.0701 | 0.0776 | 0.0982 | 0.1213 | 0.1468 |
| 2.0 | 0.0013 | 0.0019 | 0.0023 | 0.0026 | 0.0035 | 0.0044 | 0.0662 | 0.0779 | 0.0864 | 0.1093 | 0.1349 | 0.1633 |
| 2.2 | 0.0015 | 0.0021 | 0.0025 | 0.0029 | 0.0038 | 0.0048 | 0.0728 | 0.0858 | 0.0951 | 0.1203 | 0.1486 | 0.1798 |
| 2.4 | 0.0016 | 0.0023 | 0.0027 | 0.0032 | 0.0042 | 0.0053 | 0.0795 | 0.0937 | 0.1038 | 0.1314 | 0.1623 | 0.1965 |
| 2.6 | 0.0018 | 0.0025 | 0.0030 | 0.0034 | 0.0045 | 0.0057 | 0.0862 | 0.1016 | 0.1126 | 0.1425 | 0.1760 | 0.2129 |
| 2.8 | 0.0019 | 0.0027 | 0.0032 | 0.0037 | 0.0048 | 0.0061 | 0.0930 | 0.1096 | 0.1214 | 0.1536 | 0.1897 | 0.2295 |
| 3.0 | 0.0020 | 0.0029 | 0.0034 | 0.0040 | 0.0052 | 0.0066 | 0.0997 | 0.1175 | 0.1302 | 0.1648 | 0.2035 | 0.2462 |
| 3.5 | 0.0024 | 0.0034 | 0.0040 | 0.0047 | 0.0061 | 0.0077 | 0.1166 | 0.1375 | 0.1523 | 0.1928 | 0.2380 | 0.2880 |
| 4.0 | 0.0027 | 0.0039 | 0.0046 | 0.0053 | 0.0070 | 0.0088 | 0.1336 | 0.1575 | 0.1745 | 0.2209 | 0.2727 | 0.3300 |
| 4.5 | 0.0031 | 0.0044 | 0.0052 | 0.0060 | 0.0079 | 0.0100 | 0.1507 | 0.1777 | 0.1969 | 0.2492 | 0.3076 | 0.3722 |
| 5.0 | 0.0034 | 0.0049 | 0.0058 | 0.0067 | 0.0088 | 0.0111 | 0.1679 | 0.1979 | 0.2195 | 0.2775 | 0.3427 | 0.4147 |
| 5.5 | 0.0038 | 0.0054 | 0.0064 | 0.0074 | 0.0097 | 0.0122 | 0.1852 | 0.2183 | 0.2419 | 0.3062 | 0.3780 | 0.4573 |
| 6.0 | 0.0041 | 0.0060 | 0.0070 | 0.0081 | 0.0106 | 0.0134 | 0.2026 | 0.2388 | 0.2645 | 0.3349 | 0.4135 | 0.5002 |
| 6.5 | 0.0045 | 0.0065 | 0.0076 | 0.0088 | 0.0115 | 0.0146 | 0.2201 | 0.2591 | 0.2874 | 0.3638 | 0.4491 | 0.5434 |
| 7.0 | 0.0048 | 0.0070 | 0.0082 | 0.0095 | 0.0124 | 0.0157 | 0.2376 | 0.2801 | 0.3104 | 0.3928 | 0.4849 | 0.5868 |
| 7.5 | 0.0052 | 0.0075 | 0.0088 | 0.0102 | 0.0133 | 0.0169 | 0.2553 | 0.3009 | 0.3334 | 0.4220 | 0.5210 | 0.6304 |
| 8.0 | 0.0056 | 0.0080 | 0.0094 | 0.0109 | 0.0143 | 0.0181 | 0.2730 | 0.3218 | 0.3566 | 0.4515 | 0.5572 | 0.6742 |
| 8.5 | 0.0059 | 0.0085 | 0.0100 | 0.0116 | 0.0152 | 0.0192 | 0.2909 | 0.3429 | 0.3799 | 0.4808 | 0.5936 | 0.7183 |
| 9.0 | 0.0063 | 0.0091 | 0.0106 | 0.0124 | 0.0161 | 0.0204 | 0.3088 | 0.3640 | 0.4034 | 0.5105 | 0.6302 | 0.7625 |
| 9.5 | 0.0067 | 0.0096 | 0.0113 | 0.0131 | 0.0171 | 0.0216 | 0.3269 | 0.3853 | 0.4269 | 0.5403 | 0.6671 | 0.8071 |
| 10.0 | 0.0070 | 0.0101 | 0.0119 | 0.0138 | 0.0180 | 0.0228 | 0.3450 | 0.4067 | 0.4506 | 0.5703 | 0.7041 | 0.8519 |
| 11.0 | 0.0078 | 0.0112 | 0.0132 | 0.0153 | 0.0199 | 0.0252 | 0.3814 | 0.4500 | 0.4984 | 0.6308 | 0.7787 | 0.9422 |
| 12.0 | 0.0085 | 0.0123 | 0.0144 | 0.0167 | 0.0219 | 0.0277 | 0.4186 | 0.4934 | 0.5467 | 0.6919 | 0.8542 | 1.0336 |
| 13.0 | 0.0093 | 0.0134 | 0.0157 | 0.0182 | 0.0238 | 0.0301 | 0.4560 | 0.5375 | 0.5955 | 0.7537 | 0.9305 | 1.1259 |
| 14.0 | 0.0101 | 0.0145 | 0.0170 | 0.0198 | 0.0258 | 0.0326 | 0.4938 | 0.5820 | 0.6449 | 0.8162 | 1.0077 | 1.2195 |
| 15.0 | 0.0109 | 0.0156 | 0.0183 | 0.0213 | 0.0278 | 0.0352 | 0.5320 | 0.6271 | 0.6949 | 0.8794 | 1.0857 | 1.3137 |
| 16.0 | 0.0116 | 0.0168 | 0.0197 | 0.0228 | 0.0298 | 0.0377 | 0.5707 | 0.6727 | 0.7454 | 0.9435 | 1.1646 | 1.4092 |
| 17.0 | 0.0124 | 0.0179 | 0.0210 | 0.0244 | 0.0319 | 0.0403 | 0.6098 | 0.7188 | 0.7964 | 1.0074 | 1.2444 | 1.5057 |
| 18.0 | 0.0133 | 0.0191 | 0.0224 | 0.0260 | 0.0339 | 0.0429 | 0.6493 | 0.7654 | 0.8481 | 1.0733 | 1.3251 | 1.6034 |
| 19.0 | 0.0141 | 0.0203 | 0.0238 | 0.0276 | 0.0360 | 0.0456 | 0.6893 | 0.8125 | 0.9003 | 1.1395 | 1.4067 | 1.7022 |
| 20.0 | 0.0149 | 0.0214 | 0.0252 | 0.0293 | 0.0381 | 0.0485 | 0.7298 | 0.8602 | 0.9532 | 1.2063 | 1.4893 | 1.8021 |

D : Travel of objective lens of collimator

f : Focal distance of checking lens

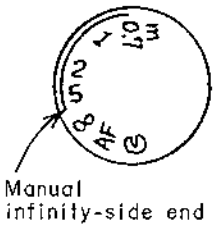
(3)Adjustments of Compensation Dials

Each value of the Exposure Compensation Dial,Aperture Ring and Focus Dial setting is resistance-divided and A-D converted.

① Adjustment of Focus Dial

1)Set the mode setting switches of the manual adjusting tool:
No.1 : ON, No.2 : ON, No.3 : OFF

2)Turn ON the Main switch of the camera and set the manual adjusting tool in camera.
3)Turn ON the test mode switch of the manual adjusting tool to set the dial setting A-D converted value display mode.
4)Then the LCD display 「FL」 and 「DATA」 are blinking alternately. The data displayed is the A-D converted value of the current Focus Dial setting.
5)Read the A-D converted values of the Focus Dial settings with the dial positioned at "AF", manual infinity-side end and "0.7m".
6)Set the Dial to "OFF" to terminate the dial setting & A-D converted value display mode and write the read value in the manual correction mode.
Address
S90 ------ A-D converted value for AF position
S92 ------ A-D converted value for manual infinity-side end
S94 ------ A-D converted value for manual 0.7m



Manual
infinity-side end

② Adjustment of Aperture Ring

1)Follow the same procedure as ① to set the dial setting & A-D converted value display mode. And turn ON the rewind switch once. Then the LCD display "5 L" and 「DATA」 are blinking alternately. The data displayed is the A-D converted value of the current Aperture Ring setting.
2)Read the A-D converted values of the Aperture Ring settings with the ring positioned at " ↳ ", "2.8", and "16".
3)Terminate the dial setting & A-D converted value display mode and then write the read values in the manual correction mode.
Address
$70 ------ A-D converted value for ↳ position
$72 ------ A-D converted value for "2.8" positions
$74 ------ A-D converted value for "16" position

③ Adjustment of Exposure Compensation Dial

1)Follow the same procedure as ① to set the dial setting & A-D converted display mode. And turn ON the rewind switch twice. Then the LCD displays "HL" and 「DATA」 are blinking alternately. The data displayed is the A-D converted value of the current Exposure Compensation Dial setting.
2)Read the A-D converted values of the Exposure Compensation Dial setting with the dial positioned at "-2.0" and"+2.0".
3)Write the read values in the manual correction mode.
Address
$5C ------ A-D converted value for "-2.0EV" position
$5E ------ A-D converted value for "+2.0EV" position

At termination of the manual correction mode,the CPU inside the camera performs interpolation between clicks.
Be sure to turn on the rewind switch before setting the Focus Dial to "OFF" to terminate the compensation value correction mode.
Unless the rewind switch is turned ON,the data is not written in EEPROM.

**(4)Adjustment of Battery Check Voltage**

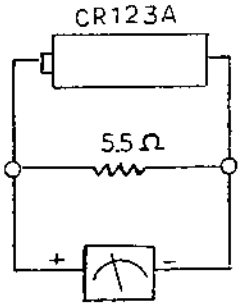
Battery check
After power-ON,power is supplid to the shutter coil and the resistance-divided value is A-D converted and read.

1)Set the mode setting switchs of the manual adjusting tool:
No.1 : OFF, No.2 : OFF, No.3 : OFF
2)Turn ON the Main Switch of the camera and set the manual adjusting tool in the camera.
3)Turn ON test mode switch of the manual adjusting tool to set the compensation value correction mode.
(In the compensation value correction mode,the old CPU displays " ◻ 1C" on the LCD while the new CPU displays" ◻ 88" and「DATA」are blinking alternately on the LCD. With the camera of the new CPU,change the address to" ◻ 1C".)
4)Write "$7A" as the data at address $1C.
5)Set the Regulated DC Power Supply to 2.43V.
6)Connect the ⊕ and ⊖ terminals of the voltage regulator to the camera body.
7)If the LCD displays " ◻ ", set the compensation value correction mode and write "$7b" as the data at address "$1C".
8)Set the Regulated DC Power Suply to 2.43V and make sure that the marking " ◻ " is not displayed.
9)If the LCD displays " ◻ " even with "$7b" written, change the data to "$7C".
* Generally,however,adjustment is achieved when data "$7A" or "$7b" is written. At the factory, data "$7C" is rarely written. Therefore,before writing "$7C", check the Regulated DC Power supply for a proper voltage or check for abnormalities.

**[Measurement of Battery Voltage]**

Load the battery with a resistance of 5.5 Ω and measure the voltage 30ms later.
The voltage must be 2.5V or above.

**Note: a) Do not measure the Battery voltage for a log time, otherwise,the battery is consumed.**



Backup Data Memory Constituents and Basic Design values

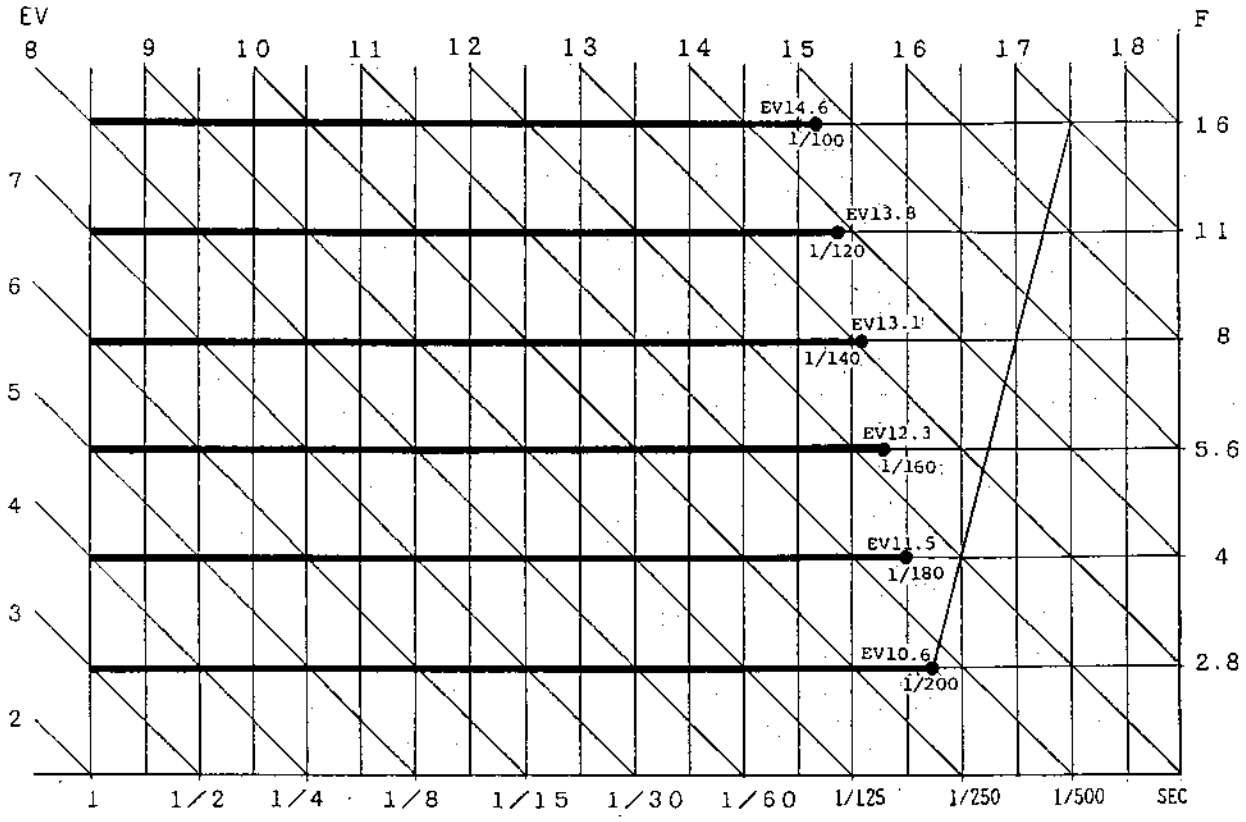
| NAME | Address | Basic Design Val | b7 ; b6 ; b5 ; b4 ; b3 ; b2 ; b1 ; b0 |
|---|---|---|---|
| BATDA1 | $1C | $7A | B1-CHECK LEVEL A-D converted value |
| BATDA2 | $1E | $00 | Not used |
| SOKHOS | $20 | $00 | Compensation value of light metering with sign, 5bits,1/4 EV step $B_0 \sim B_4$ |
| SHUTER | $22 | $00 | Shutter delay compensation value,1step 110 $\mu$ s,16steps |
| PLSALL | $24 | $7E | Drive pulse count for all lenses (AF step count) |
| PLSMGN | $26 | $05 | Lens drive pulse count for AF $\infty$ |
| PLSLMT | $28 | $0A | Lens drive pulse count for max.distance allowing AF-LED reflection |
| PLSDT1 | $2A | $10 | Lens drive pulse count for 5.00m |
| PLSDT2 | $2C | $31 | Lens drive pulse count for 1.67m |
| PLSDT3 | $2E | $55 | Lens drive pulse count for 1.00m |
| PLSDT4 | $30 | $7C | Lens drive pulse count for 0.71m |
| AFDAT1 | $32 | $48 | Raw data from AF-IC for 5.00m |
| AFDAT2 | $34 | $6B | Raw data from AF-IC for 1.67m |
| AFDAT3 | $36 | $8F | Raw data from AF-IC for 1.00m |
| AFDAT4 | $38 | $B3 | Raw data from AF-IC for 0.71m |
| AFCON1 | $3A | $F1 | Inclination of AF liner formula (AFDAT1 & AFDAT2) |
| | $3C | $00 | |
| AFCON2 | $3E | $00 | Inclination of AF liner formula (AFDAT2 & AFDAT3) |
| | $40 | $01 | |
| AFCON3 | $42 | $11 | Inclination of AF liner formula (AFDAT3 & AFDAT4) |
| | $44 | $01 | |
| AFSFT1 | $46 | $C8 | Intercept of AF linear formula (AFDAT1 & AFDAT2) |
| | $48 | $33 | |
| | $4A | $00 | |
| AFSFT2 | $4C | $00 | Intercept of AF linear formula (AFDAT2 & AFDAT3) |
| | $4E | $3A | |
| | $50 | $00 | |
| AFSFT3 | $52 | $2A | Intercept of AF linear formula (AFDAT3 & AFDAT4) |
| | $54 | $43 | |
| | $56 | $00 | |
| AFTHOS | $58 | $80 | AF-IC temperature compensation |
| AFFR1 | $5A | $0D | Pulse count compensation for $\infty$ position 0 $\sim$ 32 |
| EXPDT1 | $5C | $0A | A-D converted value of Exposure Compensation Dial setting (-2.0EV) |
| EXPDT2 | $5C | $F6 | A-D converted value of Exposure Compensation Dial setting (+2.0EV) |
| EXPAD0 | $60 | $19 | A-D converted compensation value of Exposure Compensation Dial setting $-2 \sim -1.5$ |
| EXPAD1 | $62 | $36 | A-D converted compensation value of Exposure Compensation Dial setting $-1.5 \sim -1.0$ |

| NAME | Address | Basic Design Value | b7 ; b6 ; b5 ; b4 ; b3 ; b2 ; b1 ; b0 |
|---|---|---|---|
| EXPAD2 | $64 | $54 | A-D converted compensation value of Exposure Compensation Dial setting -1.0 ~ -0.5 |
| EXPAD3 | $66 | $71 | A-D converted compensation value of Exposure Compensation Dial setting -0.5 ~ 0.0 |
| EXPAD4 | $68 | $8E | A-D converted compensation value of Exposure Compensation Dial setting 0.0 ~ +0.5 |
| EXPAD5 | $6A | $AC | A-D converted compensation value of Exposure Compensation Dial setting +0.5 ~ +1.0 |
| EXPAD6 | $6C | $C9 | A-D converted compensation value of Exposure Compensation Dial setting +1.0 ~ +1.5 |
| EXPAD7 | $6E | $E7 | A-D converted compensation value of Exposure Compensation Dial setting +1.5 ~ +2.0 |
| FRGDT1 | $70 | $18 | A-D converted value of Aperture Ring setting ( ϟ ) |
| FRGDT2 | $72 | $48 | A-D converted value of Aperture Ring setting (2.8) |
| FRGDT3 | $74 | $E8 | A-D converted value of Aperture Ring setting (16) |
| FRGAD0 | $76 | $24 | A-D converted compensation value of Aperture Ring setting ϟ ~ ϟϟ |
| FRGAD1 | $78 | $3C | A-D converted compensation value of Aperture Ring setting ϟϟ 2.8 |
| FRGAD2 | $7A | $4C | A-D converted compensation value of Aperture Ring setting 2.8+1/8 |
| FRGAD3 | $7C | $5C | A-D converted compensation value of Aperture Ring setting 2.8+5/8 |
| FRGAD4 | $7E | $6C | A-D converted compensation value of Aperture Ring setting 4+1.8 |
| FRGAD5 | $80 | $7C | A-D converted compensation value of Aperture Ring setting 4+5/8 |
| FRGAD6 | $82 | $8C | A-D converted compensation value of Aperture Ring setting 5.6+1/8 |
| FRGAD7 | $84 | $9C | A-D converted compensation value of Aperture Ring setting 5.6+5.8 |
| FRGAD8 | $86 | $AC | A-D converted compensation value of Aperture Ring setting 8+1/8 |
| FRGAD9 | $88 | $BC | A-D converted compensation value of Aperture Ring setting 8+5/8 |
| FRGADA | $8A | $CC | A-D converted compensation value of Aperture Ring setting 11+1/8 |
| FRGADB | $8C | $DC | A-D converted compensation value of Aperture Ring setting 11+5/8 |
| FRGADC | $8E | $EC | A-D converted compensation value of Aperture Ring setting 16+1/8 |
| FCSDT1 | $90 | $36 | A-D converted value of Focus Dial setting AF |
| FCSDT2 | $92 | $7C | A-D converted value of Focus Dial setting 16 |
| FCSDT3 | $94 | $F6 | A-D converted value of Focus Dial setting 0.7 |
| FCSAD1 | $96 | $25 | A-D converted compensation value of Focus Dial setting OFF ~ AF |
| FCSAD2 | $98 | $48 | A-D converted compensation value of Focus Dial setting AF ~ ∞ |
| FCSAD3 | $9A | $6B | A-D converted compensation value of Focus Dial setting ∞ ~ 16 |
| FCSCON | $9C<br>$9E | $FD<br>$00 | Inclination of linear formula for Focus Dial setting<br>0.7m to 16m |
| FCSSTP | $A0<br>$A2 | $8C<br>$75 | Intercept of linear formula for Focus Dial seeting<br>0.7m to 16m |
| SIBH00 | $A4 | $00 | Exposure compensation value of Aperture Ring setting 2.8 |
| SIBH01 | $A6 | $00 | Exposure compensation value of Aperture Ring setting Intermediate |
| SIBH02 | $A8 | $00 | Exposure compensation value of Aperture Ring setting 4 |
| SIBH03 | $AA | $00 | Exposure compensation value of Aperture Ring setting Intermediate |

| NAME | Address | Basic Design Value | b7 ; b6 ; b5 ; b4 ; b3 ; b2 ; b1 ; b0 |
|---|---|---|---|
| SIBH04 | $AC | $00 | Exposure compensation value of Aperture Ring setting 5.6 |
| SIBH05 | $AE | $00 | Exposure compensation value of Aperture Ring setting Intermediate |
| SIBH06 | $B0 | $00 | Exposure compensation value of Aperture Ring setting 8 |
| SIBH07 | $B2 | $00 | Exposure compensation value of Aperture Ring setting Intermediate |
| SIBH08 | $B4 | $00 | Exposure compensation value of Aperture Ring setting 11 |
| SIBH09 | $B6 | $00 | Exposure compensation value of Aperture Ring setting Intermediate |
| SIBH0A | $B8 | $00 | Exposure compensation value of Aperture Ring setting 16 |
| CINPLS | $BA | $02 | Pulse width for (Barrier close ⟷ Main ON,AF reset) |
| CINBRK | $BC | $A0 | Pulse width for barrier close |
| AFMOV1 | $BE | $08 | Pulse width for drive in AF setting direction Remainder 50 or more |
| AFMOV2 | $C0 | $18 | Pulse width for drive in AF setting direction Remainder 49 to 20 |
| AFMOV3 | $C2 | $20 | Pulse width for drive in AF setting direction Remainder 19 or lenss |
| MAKDUT | $C4 | $00 | Reverse brake time when winding and blank shots |
| CHGLVL | $C6 | $7F | Flash charge level (A-D converted voltage) |
| | $C8 ~ $CA | — | Auto adjustment |

C-5 Others

C-5-1 Program AE Chart

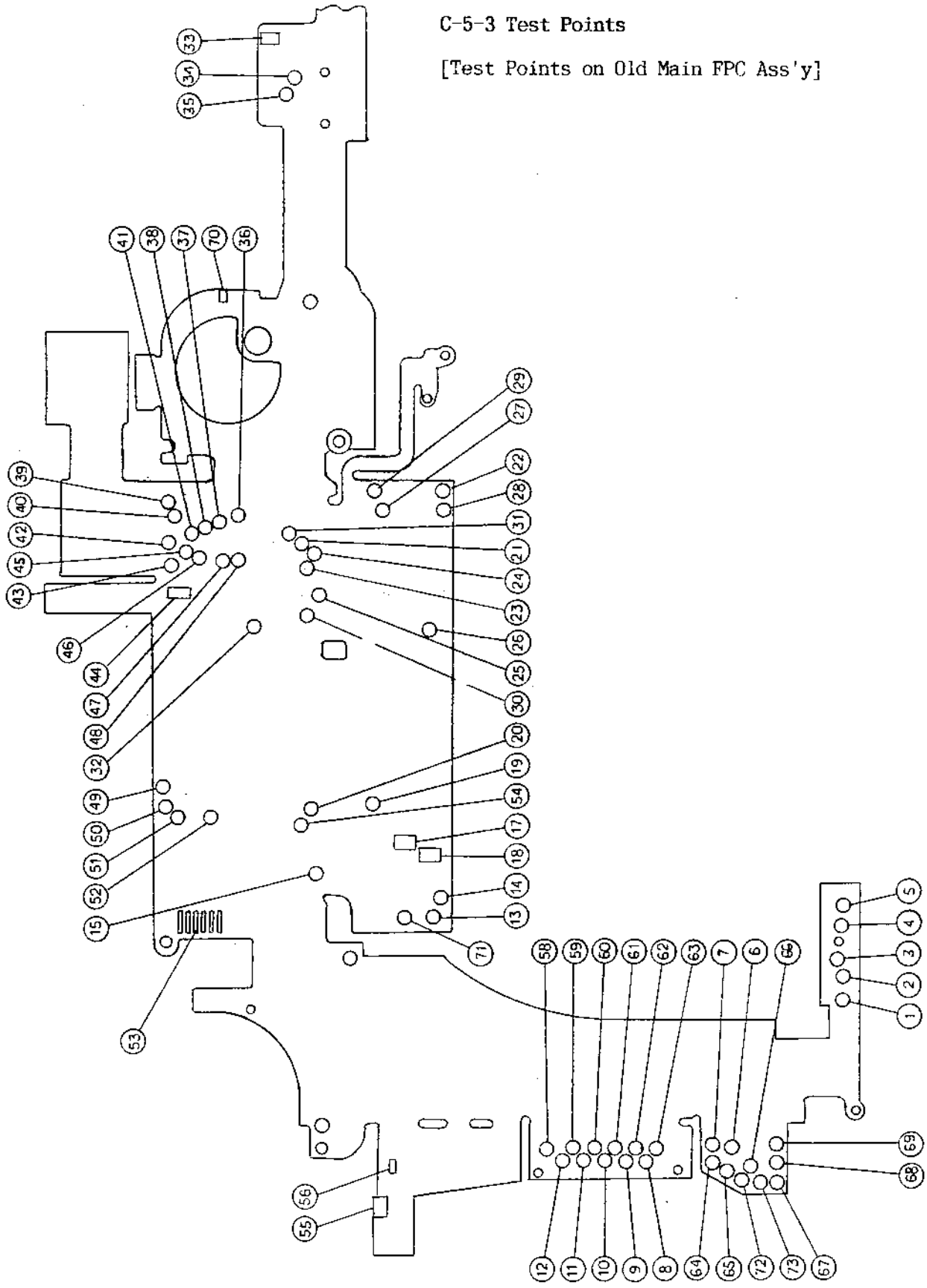



C-5-2 Current Consumption

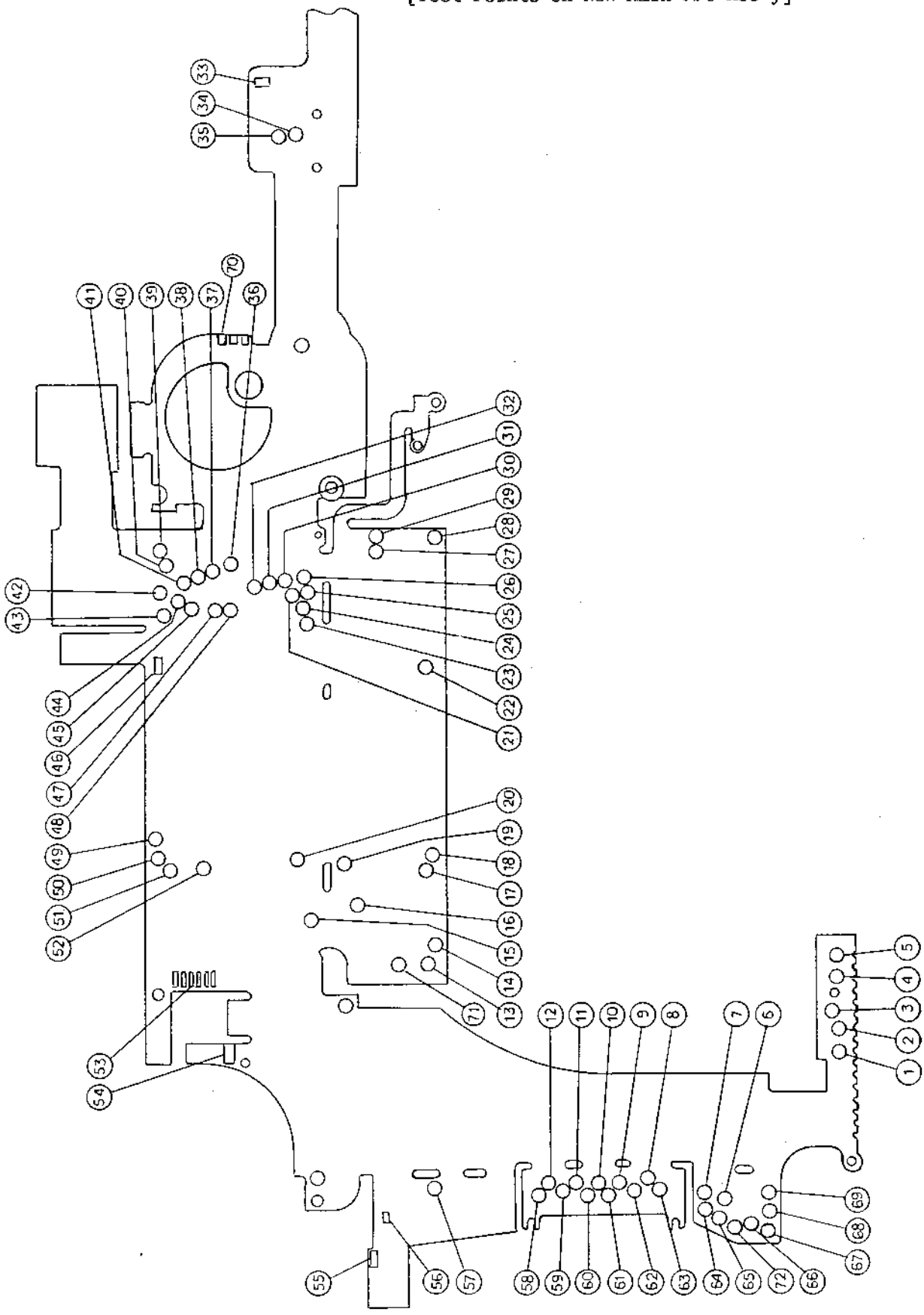
| | | |
|---|---|---|
| ○ Stand-by current | 20 μ A or less | Check at 3V (constant) |
| ○ Winding | 500mA or less | |
| ○ Rewinding | 500mA or less | |
| ○ Rerract barrel operation | 500mA or less | |
| ○ AF operation | 45mA or less | |
| ○ Auto stop | 1.5A or less | |

C-5-3 Test Points

[Test Points on Old Main FPC Ass'y]



[Test Points on New Main FPC Ass'y]



[Test Points on Main FPC Ass'y]

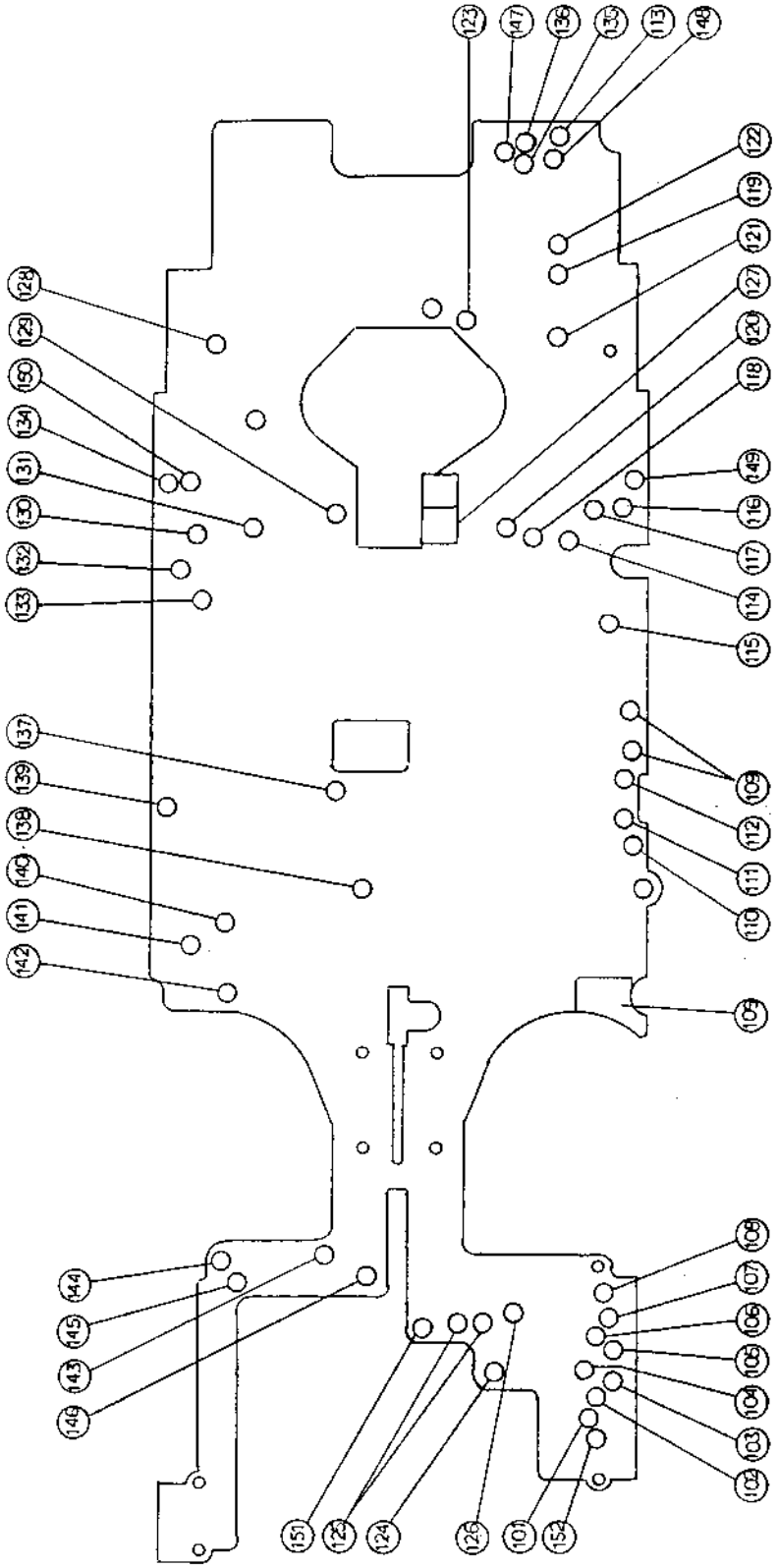
| T.P. | Symbol | I/O | Function / Use | CPU Pin |
|---|---|---|---|---|
| 1 | PO-SW | O | Power switch. Boosting circuit contorol."H" active | 54 |
| 2 | OSC | | Flash charge signal. At dorop of battery voltage, protective circuit (B1) operates to stop charge forcibly. H--- charge/L ---Stop | |
| 3 | B.C | Ian | Battery check voltage | 62 |
| 4 | AE-DATA | I | Light metering data. Data output of "L" pulse width (LAD) | 73 |
| 5 | $\overline{\text{LED-WI}}$ | O | LED control of photo coupler for WIND. Active "L" | 35 |
| 6 | T.C | Ian | Temperature detector input. About 2.5V at room temperature | 61 |
| 7 | $\overline{\text{REW}}$ | I | Forced rewind switch | 77 |
| 8 | DX4 | I | DX contact | 50 |
| 9 | DX2 | I | DX contact } However,output is "L" in stop mode | 48 |
| 10 | DX0 | I | DX contact | 46 |
| 11 | SI | I | Serial data input | 41 |
| 12 | SCK | O | Serial clock | 39 |
| 13 | CS | O | Chip select of IC103. Active "H" | 2 |
| 14 | $\overline{\text{LED-AF}}$ | O | LED control of photo coupler for AF. Active "L" | 36 |
| 15 | FSET | Ian | Focus Dial setting. ⋐ --- Low level,0.7m---High level | 59 |
| 16 | PRE | | Old Main FPC --- Missing number<br>New Main FPC --- Protector reset input for IC103.<br>Protector data is rewritten at "H". | |
| 17 | CHECK | I | Release check signal (S1) | 80 |
| 18 | RELEASE | I | Release signal (S2) | 79 |
| 19 | $\overline{\text{AF-DATA}}$ | I | Auto Focus data. Number of "L" pulses is counted by CPU. | 45 |
| 20 | A.SET | Ian | Aperture Ring setting ↯ --- Low level<br>F16 --- High level | 58 |
| 21 | M1 | O | Control motor driver selector circuit | 6 |
| 22 | G.C | O | Gate control. Control of flash. Active "H" | 51 |

* I/O : With CPU (IC101) as reference
* Ian : Analog input (0 to 5V)

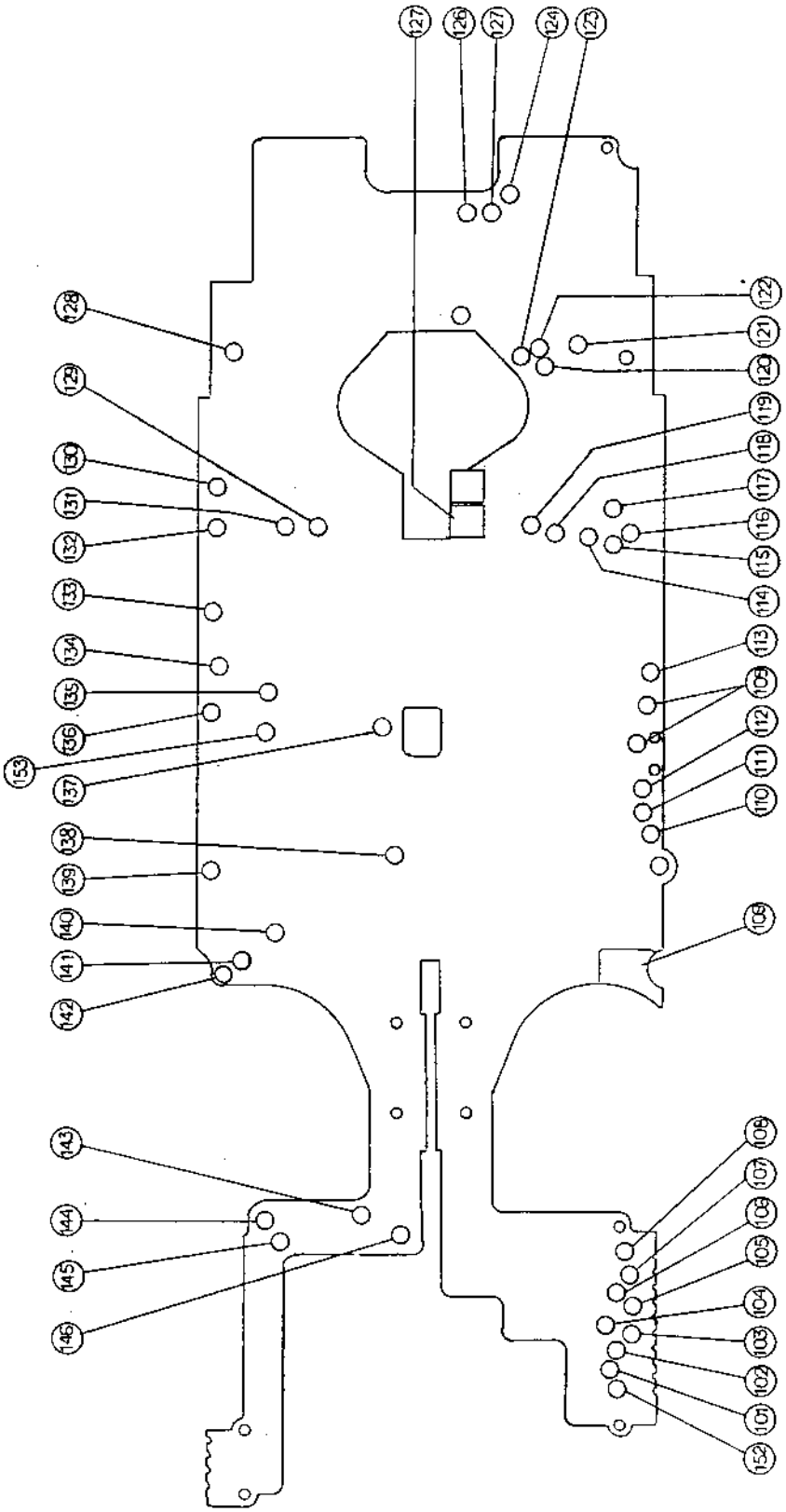
| T.P. | Symbol | I/O | Function / Use | CPU Pin |
|---|---|---|---|---|
| 23 | DATE | 0 | Data module control signal. Imprint of"H"pulse width | 3 |
| 24 | M2 | 0 | Control of motor driver selector circuit | 5 |
| 25 | MD2 | 0 | Motor driver select signal | 75 |
| 26 | MD1 | 0 | Motor driver select signal | 74 |
| 27 | $\overline{\text{SELF-L}}$ | 0 | Self LED signal. Active "L" | 29 |
| 28 | C-UP | Ian | Charge completion signal. About 2.3 (V) at charge completion (300V) | 63 |
| 29 | $V_{BAT}$ | | Battery ⊕ line | |
| 30 | MD3 | 0 | Motor driver select signal | 76 |
| 31 | S1 | 0 | Control of motor driver selector cicuit | 7 |
| 32 | ± | Ian | Exposure compensation -2EV---Low level +2EV---Hight level | 60 |
| 33 | $V_{BAT}$ | | Same as T.P. #29 | |
| 34 | CODE2 | I | Retract barrel code 2 | 57 |
| 35 | CODE1 | I | Retract barrel code 1 | 56 |
| 36 | F- ϟ | | Cathode of LED " ϟ " inside viewfinder | |
| 37 | F- ▶ | | Cathode of LED " ▶ " inside viewfinder | |
| 38 | F- ± | | Cathode of LED " ± " inside viewfinder | |
| 39 | STB | 0 | Strobe signal of IC102. H---Data change can be accepted. | 8 |
| 40 | F- ◀ | | Cathode of LED " ◀ " inside viewfinder | |
| 41 | F-LT | | Cathode of LED "LT" inside viewfinder | |
| 42 | F-30 | | Cathode of LED "30" inside viewfinder | |
| 43 | F-P | | Cathode of LED "P" inside viewfinder | |
| 44 | IR-LED | | Infrared LED control.Open collector | |
| 45 | F-125 | | Cathode of LED "125" inside viewfinder | |
| 46 | F-500 | | Cathode of LED "500" inside viewfinder | |
| 47 | F- ● | | Cathode of LED "●" inside viewfinder | |
| 48 | F.COM | | Common anode of LEDs inside viewfinder (excl." ϟ ") | |

| T.P. | Symbol | I/O | Function / Use | CPU Pin |
|---|---|---|---|---|
| 49 | INT4CNT | O | IC104 control. "H" in stop mode | 37 |
| 50 | FSET-P | I | Pulse detect for Focus Dial | 38 |
| 51 | $\overline{\text{AF-ST}}$ | O | Auto Focus signal.Start at "L" pulse | 34 |
| 52 | SH-SW | I | Shutter trigger signal. Detection of blade condition. Shutter open---H, Shutter close---L | 44 |
| 53 | $\overline{\text{LED-ENA}}$ | O | LEDs inside viewfinder are enabled to light up. Active "L" | 30 |
| 54 | SELF | I | Self-timer mode switch (S3) | 55 |
| 55 | B.COV | I | Back Cover switch | 43 |
| 56 | F-PULS | | Pulse signal for Focus Dial | |
| 57 | VCC2 | | Old Main FPC ---Missing number<br>New Main FPC ---Reference voltage for Focus Dial | |
| 58 | ACK | O | Acknowledge signal.Use for cmmunication between IC101 and adjuster. | 29 |
| 59 | SO | O | Serial data output | 40 |
| 60 | GND | | GND line | |
| 61 | DX1 | I | DX contact } However,output is "L"in stop mode. | 47 |
| 62 | DX3 | I | DX contact } | 49 |
| 63 | $\overline{\text{TEST}}$ | I | Test mode transition contacts | 78 |
| 64 | PI-P | I | Pulse output after waveform correction for photo interrupter | 42 |
| 65 | $\overline{\text{RESET}}$ | I | IC101 reset input terminal | 72 |
| 66 | AE-ST | O | Light metering start signal (SP) | 1 |
| 67 | PO-CHK | I | Power check. Judgment of booster output level "L" : Booster output insufficient | 54 |
| 68 | Vcc | | 5V line | |
| 69 | Vdd | | Power line of IC101. At PH----About 4.75[V]<br>In stop mode---Battery voltage | |
| 70 | Vcc | | Same as T.P. #68 | |
| 71 | SCK | I | Same as T.P. #12 | |
| 72 | WAVE | | Photo interrupter output waveform | |
| 73 | AF-Vdd | | Old Main FPC : Power line constant voltage for IC301 is 3V.<br>New Main FPC : Missing number | |

[Test Points on Old Sub FPC Ass'y]



[Test Points on New Sub FPC Ass'y]



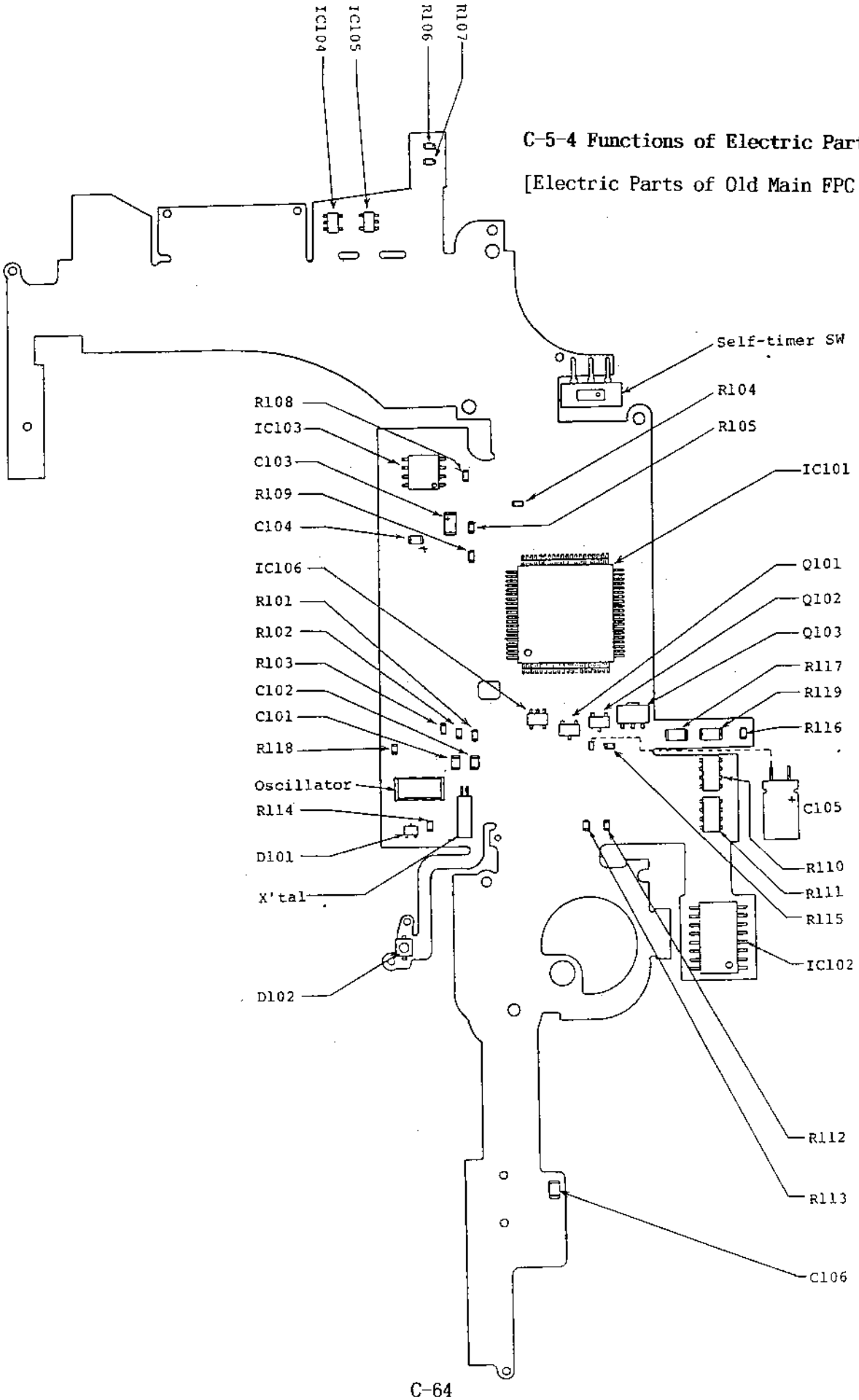
[Test Points on Sub FPC Ass'y]

| T.P. | Symbol | I/O | Function / Use | CPU Pin |
|---|---|---|---|---|
| 101 | $V_{BAT}$ | | Same as T.P. #29 | |
| 102 | S1 | O | Same as T.P. #31 | |
| 103 | M1 | O | Same as T.P. #21 | 6 |
| 104 | M2 | O | Same as T.P. #24 | 5 |
| 105 | MD1 | O | Same as T.P. #26 | 74 |
| 106 | MD2 | O | Same as T.P. #25 | 75 |
| 107 | MD3 | O | Same as T.P. #30 | 76 |
| 108 | DATE | O | Same as T.P. #23 | 3 |
| 109 | GND | | Same as T.P. #60 | |
| 110 | SWING | | IC201 switching output } Connect L201 between | |
| 111 | VI2 | | IC201 power terminal } these. | |
| 112 | 6V | | IC201 booster output 6[V] | |
| 113 | Vdd | | Same as T.P. #69 * Symbol of this test point on new Sub FPC is VCPU. | |
| 114 | PI-P | | Same as T.P. #64 | 42 |
| 115 | OSC | | Same as T.P. #2 | |
| 116 | $\overline{\text{LED-WI}}$ | O | Same as T.P. #5 | 35 |
| 117 | AE-DATA | I | Same as T.P. #4 | 73 |
| 118 | WAVE | | Photo interrupter output waveform | |
| 119 | PO-SW | O | Same as T.P. #1 | 54 |
| 120 | AE-ST | O | Same as T.P. #66 | 1 |
| 121 | BC | Ian | Same as T.P. #3 | 62 |
| 122 | $\overline{\text{REW}}$ | I | Same as T.P. #7 | 77 |
| 123 | $\overline{\text{RESET}}$ | I | Same as T.P. #65 | 72 |
| 124 | AF-M ⊕ | | AF motor ⊕ terminal | |
| 125 | M-COM | | Common terminal (AF motor ⊖ terminal and wind motor ⊖ terminal) | |
| 126 | W-M ⊕ | | Wind motor ⊕ terminal | |
| 127 | DATE-X | | Date module X contact | |

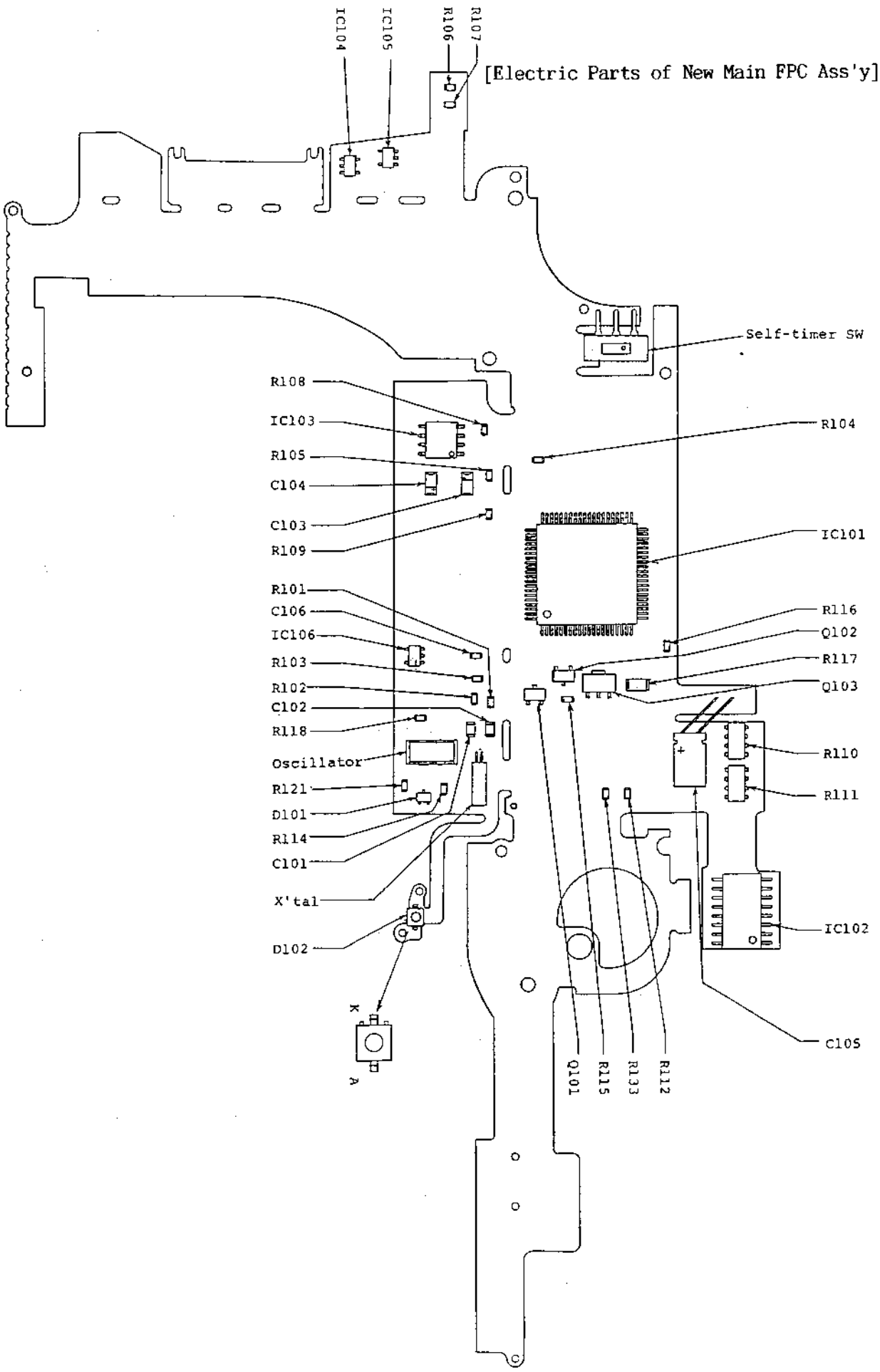
| T.P. | Symobl | I/O | Function / Use | CPU Pin |
|---|---|---|---|---|
| 128 | T.C. | Ian | Same as T.P. #6 | 61 |
| 129 | Vs | | Reference voltage for IC207. Voltage as against GND 1.2[V] | |
| 130 | SPD-C | | SPD cathode | |
| 131 | VR | | Light metering VR voltage. Adjust control so that voltage between VR and VS is 360 ±5[mV] | |
| 132 | SPD-A | | SPD anode | |
| 133 | Vout | | Light metering output voltage | |
| 134 | CO | | Dual slope integration amplifier output | |
| 135 | PO-CHK | I | Same as T.P. #67 | 54 |
| 136 | Vcc | | Same as T.P. #68 | |
| 137 | Vs1,2 | | Power voltage for IC205 2.2[V] | |
| 138 | VI2 | | Same as T.P. #111 | |
| 139 | $V_{BJ}$ | | Booster output monitor input | |
| 140 | SCC | | Switching current control | |
| 141 | 6V | | Same as T.P. #112 | |
| 142 | REF | | IC201 voltage comparison input | |
| 143 | SH2 | | Shutter driver output | |
| 144 | SH1 | | Shutter driver output (=$\overline{SH2}$) | |
| 145 | SH4 | | Shutter driver output | |
| 146 | SH3 | | Shutter driver output (=$\overline{SH4}$) | |
| 147 | AF-Vdd | | Same as T.P. #73 | |
| 148 | GND | | Same as T.P. #60 | |
| 149 | Vdd | | Same as T.P. #69 | |
| 150 | CI | | Dual slope integration amplifier input | |
| 151 | $C_{AF}$ ⊕ | | Plus teminal of C105 for infrared LED drive 6V | |
| 152 | GND | | Same as T.P. #60 | |
| 147 ~151 | | | Missing number on new Sub FPC | |
| 153 | SH ENA | | Old Sub FPC : Missing number<br>New Sub FPC : Enable signal of IC205 ("H" during shutter operation) | |

## C-5-4 Functions of Electric Parts

[Electric Parts of Old Main FPC Ass'y]



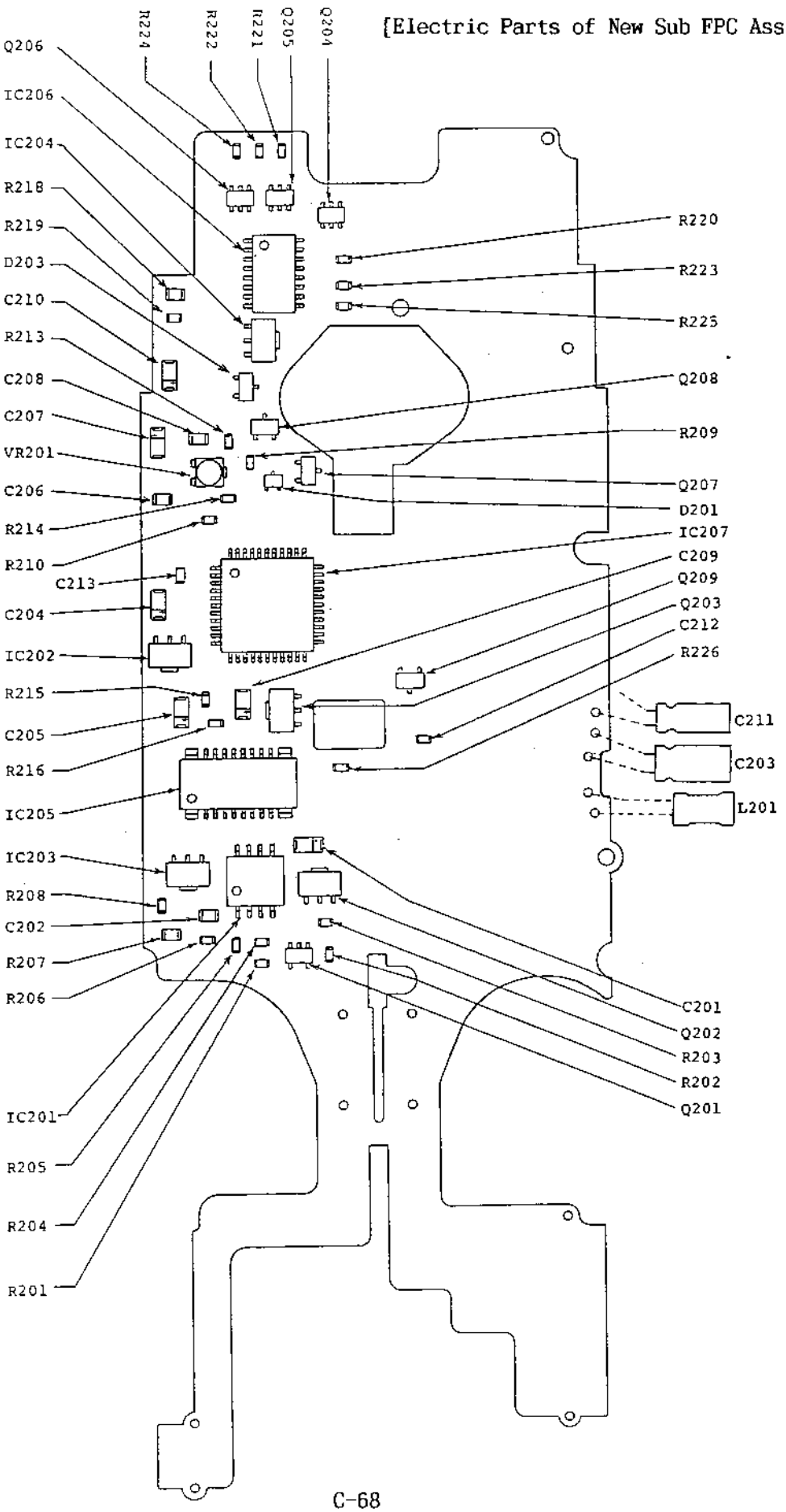
[Electric Parts of New Main FPC Ass'y]



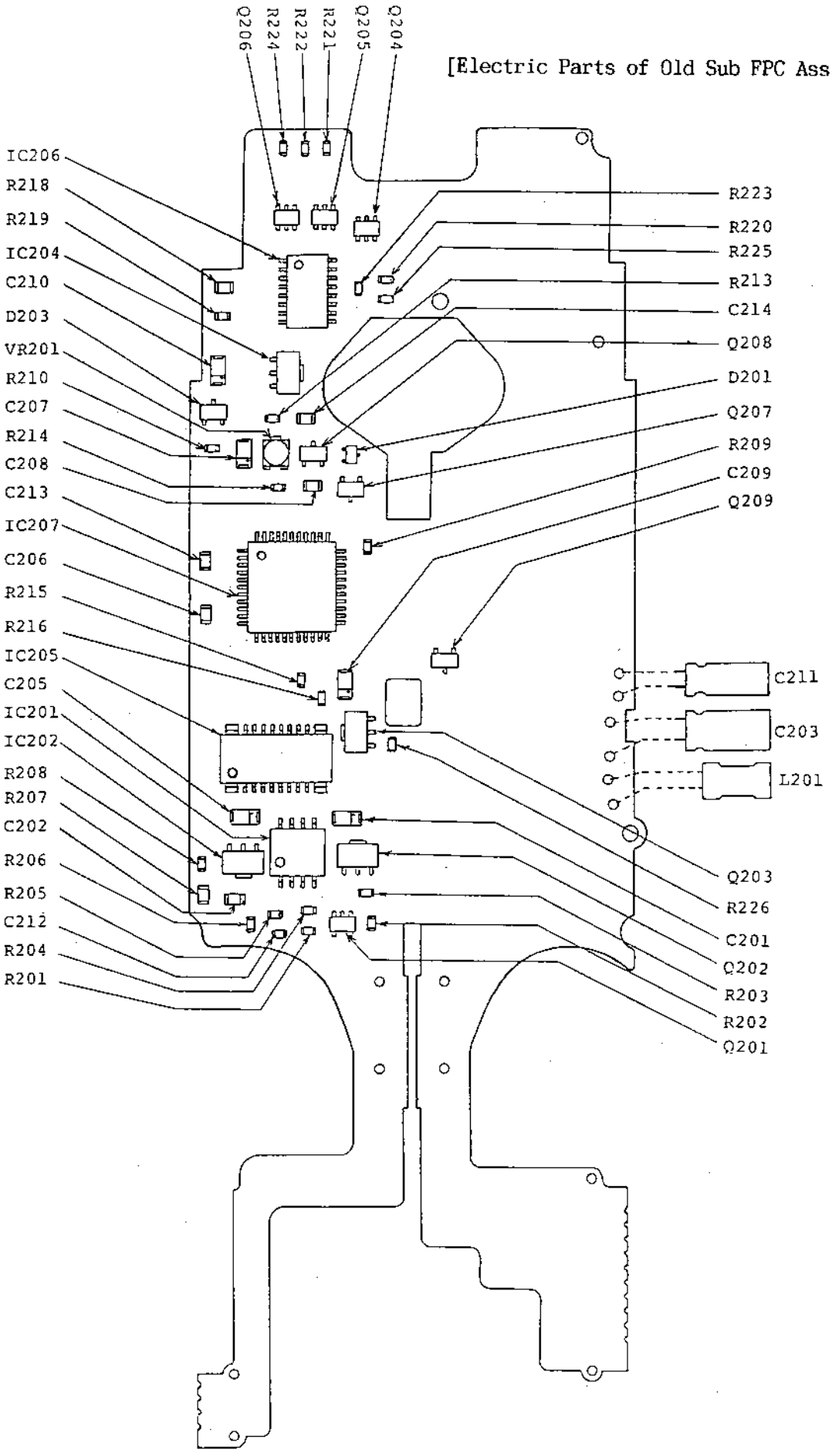
| Functions of Electric Parts of Main FPC Ass'y | |
|---|---|
| Symbol | Function |
| Transister | |
| Q101 | For power supply for LEDs inside viewfinder |
| Q102 | For lighting Focus LED |
| Q103 | For lighting Focus LED |
| Diode | |
| D101 | For LCD bias power (At CPU sleep) |
| D102 | Self-timer LED |
| Capacitor | |
| C101 | Crystal oscillation |
| C102 | Crystal oscillation |
| C103 | Vdd stabilization |
| C104 | Vref stabilization |
| C105 | Focus LED drive |
| C106 | Chattering removal for retract barrel code 2 |
| Resistor | |
| R101 | LCD bias resistance |
| R102 | LCD bias resistance |
| R103 | LCD bias resistance |
| R104 | Shutter trigger pull down (10K) |
| R105 | AF data pull up (10K) |
| R106 | Focusing pulse pull up (1M) |
| R107 | Back Cover switch pull up (1M) |
| R108 | LED current limitation for AF phote interrupter (510Ω) |
| R109 | Flash (charge) limitation (10K) |
| R110 | Current limitation for LEDs inside viewfinder (120Ω X 4) |
| R111 | Current limitation for LEDs inside viewfinder (120Ω X 4) |
| R112 | Current limitation for " ● " focus LED (82Ω) |

| Symbol | Function |
|---|---|
| R113 | Current limitation for " ↯ " LED (430Ω) |
| R114 | Current limitation for self-timer LED (150Ω) |
| R115 | Q103 base resistance (150Ω) |
| R116 | Q103 base-emitter resistance (1K) * R115 and R116 drive Q103. |
| R117 | Current setting for Focus LED (0.39Ω) * 0.22 for new Main FPC |
| R118 | Oscillation stabilization (330K) |
| R119 | Current setting for distance metering LED (0.47Ω) * Abolished on new Main FPC |
| R121 | CPU input protection (10K) * Employed for new Main FPC |
| IC | |
| IC101 | System control (CPU) |
| IC102 | Shift register for LEDs inside viewfinder |
| IC103 | EEPROM |
| IC104 | Analog switch |
| IC105 | Analog switch |
| IC106 | AF,winding motor drive |
| X'tal | 32KHz oscillation (crystal oscillator) |
| OSC | 4.19MHz oscillation (ceramic oscillator) |

[Electric Parts of New Sub FPC Ass'y]



[Electric Parts of Old Sub FPC Ass'y]

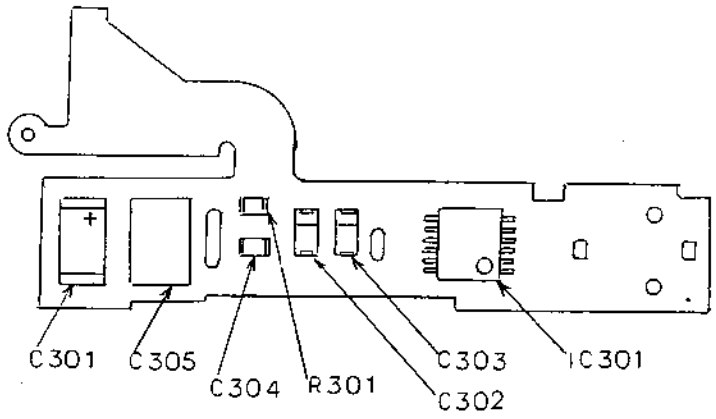


| Functions of Electric Parts of Sub FPC Ass'y | |
|---|---|
| Symbol | Function |
| Transistor | |
| Q201 | Battery check,PH → ON |
| Q202 | PH → ON power supply (booster switching transistor) |
| Q203 | Shutter power supply |
| Q204 | Winding motor control |
| Q205 | Winding and AF motor control |
| Q206 | AF motor drive |
| Q207 | Date imprinting |
| Q208 | Vs flow-in control of P1 current |
| Q209 | Winding PI switching |
| Diode | |
| D201 | Vs flow-in control of P1 current |
| D203 | Vdd supply |
| Capacitor | |
| C201 | Power stabilization at PH → ON (IC201 supply voltage) Primary side of booster |
| C202 | 6V stabilization (bypass capacitor) |
| C203 | 6V stabilization |
| C204 | 3V stabilization * Abolished on new Sub FPC |
| C205 | 5V stabilization |
| C206 | Integral capacitor |
| C207 | Vcc stabilization |
| C208 | Vs stabilization (bypass capacitor) |
| C209 | Shutter drive voltage stabilization |
| C210 | $V_B$ stabilization |
| C211 | Vdd stabilization |
| C212 | Battery check stabilization |
| C213 | Light metering stabilization (Compensation capacitor) |

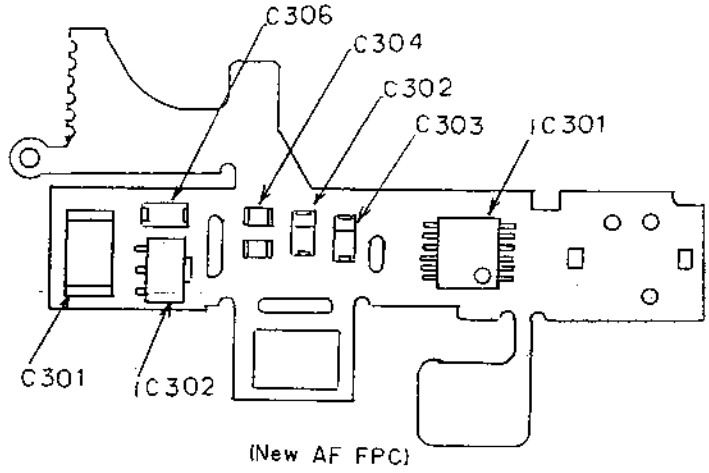
| Symbol | Function |
|---|---|
| C214 | Vs stabilization (bypass capacitor) |
| Resistor | |
| R201 | Battery check (10K) |
| R202 | Q202 base resistance (150Ω) |
| R203 | Q202 base-emitter resistance (1K) |
| R204 | Boosting peak current adjustment (510Ω) |
| R205 | Booster output (6V) setting (4.7K) |
| R206 | Booster output (6V) setting (18K) |
| R207 | Capacitor charge for Fucus LED (39Ω) |
| R208 | AE-IC VBJ (booster output (6V) monitor) (130K) |
| R209 | Vs flow-in control of PI current (2K) |
| R210 | Oscillation prevention (5.1K) |
| R213 | VR voltage (360mV) (10K) |
| R214 | VR voltage (360mV) (1.5K) |
| R215 | Setting of shutter constant voltage (2.2V) (4.7K) |
| R216 | Setting of shutter constant voltage (2.2V) (3.9K) |
| R218 | Linear resistance for temperature detection (AF compensation) (2.4K 3300ppm) |
| R219 | Temperature detection (AF compansation) (2.4K) |
| R220 | Motor driver IC base resistance (150Ω) |
| R221 | Motor driver IC base resistance (150Ω) |
| R222 | Motor driver IC base resistance (150Ω) |
| R223 | Motor driver IC base resistance (150Ω) |
| R224 | Motor driver IC base resistance (150Ω) |
| R225 | Motor driver IC base resistance (150Ω) |
| R226 | Current limitation for winding P1-LEDs (1K) |
| IC | |
| IC201 | Switching regulator |

| Symbol | Function |
|---|---|
| IC202 | 3V (constant) IC (IC202 is abolished on new Sub FPC and IC302 is emloyed on AF FPC instead) |
| IC203 | 5V (constant IC) |
| IC204 | Voltage detector IC |
| IC205 | Motor drive (shutter) |
| IC206 | Motor drive (shutter) |
| IC207 | Analog IC |
| L201 | Booster oscillation |
| VR201 | Reference voltage adjustment |

Functions of Electric Parts on AF FPC

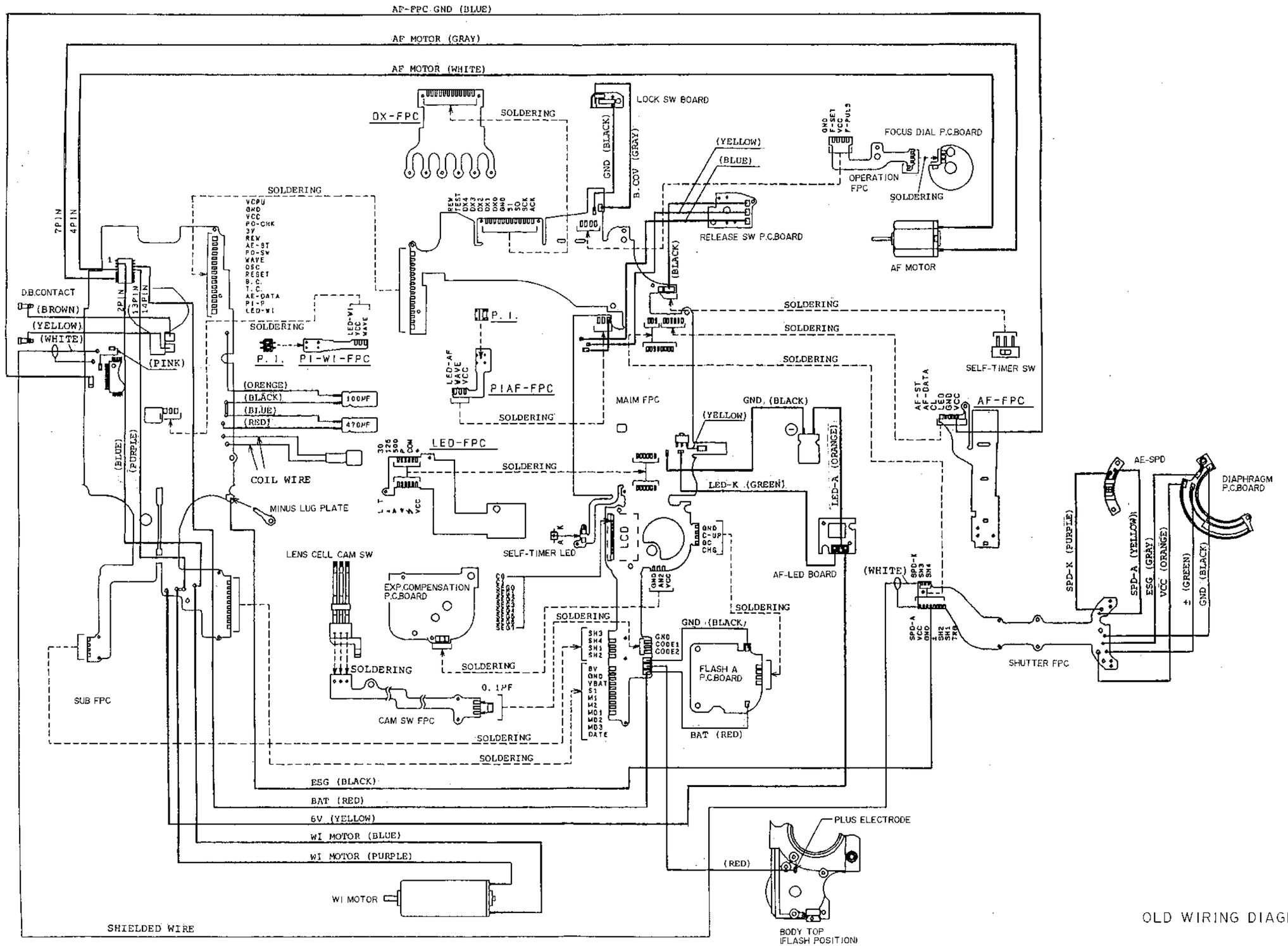


(Old AF FPC)

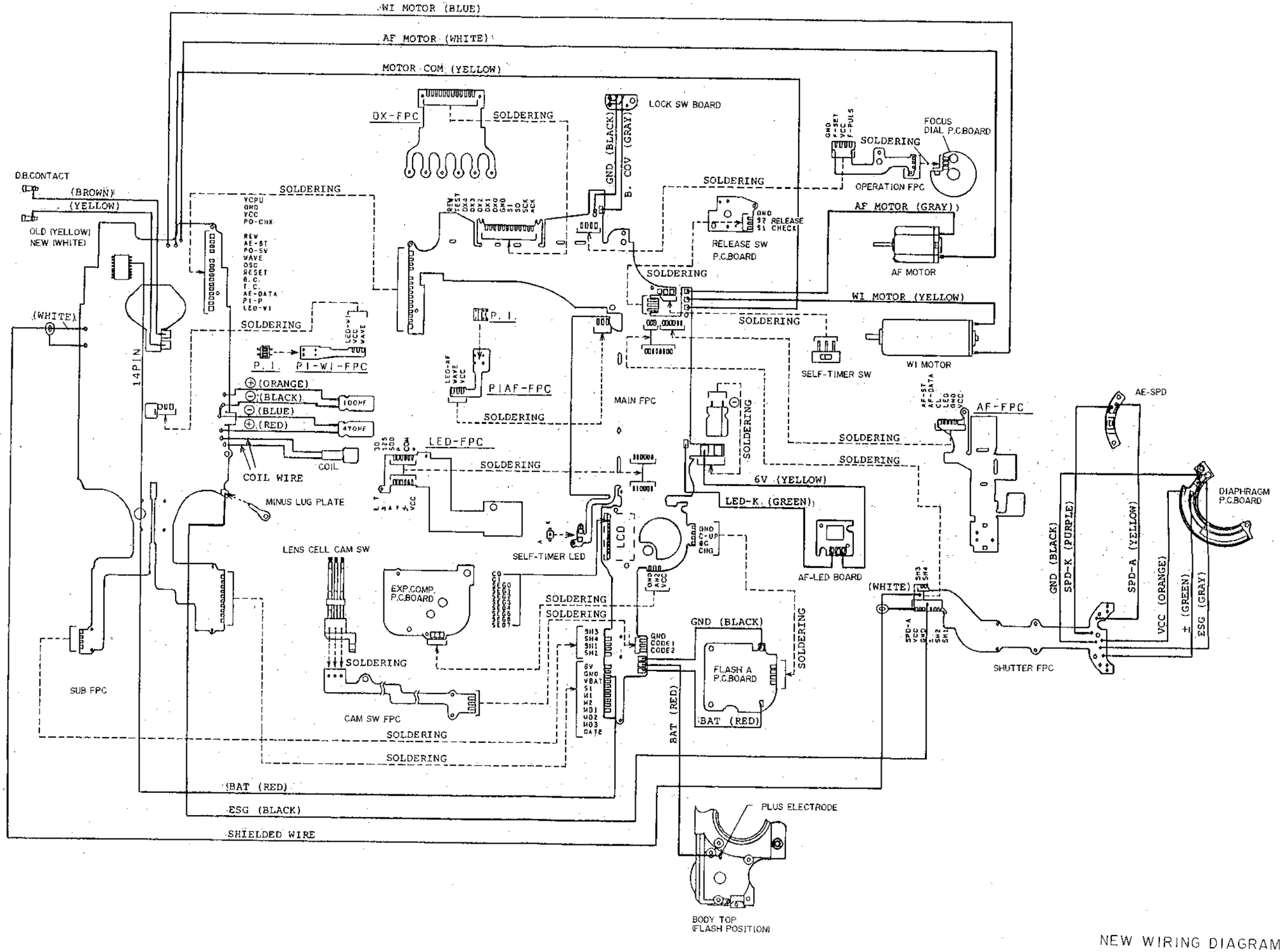


(New AF FPC)

| Symbol | Function |
|---|---|
| C301 | Power stabilization capacitor |
| C302 | Memory capacitor |
| C303 | Memory capacitor |
| C304 | Oscillation capacitor |
| C305 | Integral capacitor |
| C306 | Vcc stabilization capacitor |
| R301 | Oscillation resistance (100K) |
| IC301 | AFIC |
| IC302 | Constant voltage IC (3V) * Moved from old Sub FPC to new AF FPC |




OLD WIRING DIAGRAM




NEW WIRING DIAGRAM

KYOCERA CORPORATION
Optical Equipment Division
27-8, 6-chome Jingumae, Shibuya-ku,
Tokyo 150 Japan

REF.NO. 3AQ-008

DATE Sept.11.1991

TECHNICAL INFORMATION

MODEL CONTAX-T2

REMARKS/DRAWINGS

CORRECTION

There are some insufficient descriptions in the Repair Manual.
Please correct your Repair Manual as follows.

☞ :Corrected portion

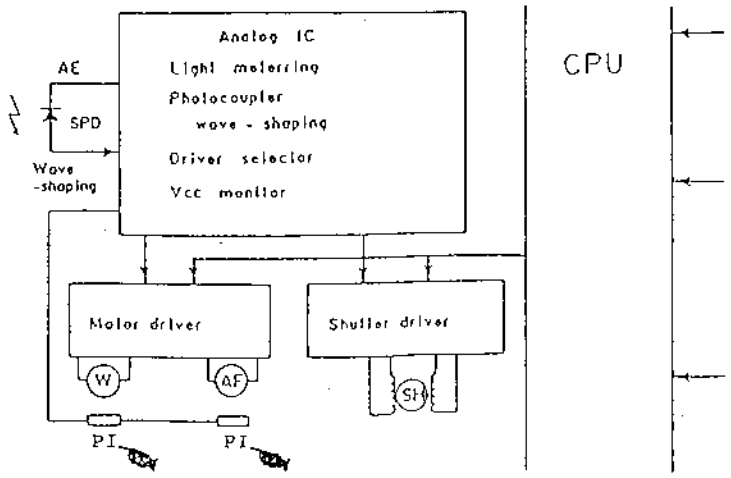
Page A-1
(ERRATUM)
Self timer : ● ( ● mark in center of focus indicatio)
(CORRECT)
Self timer : ● ( ● mark in center of focus indication) ☞

Page A-2
(ERRATUM)
Control steps 118 steps (hominal) Distance:0.698 7.8710m
(CORRECT)
Control steps 118 steps (nominal) Distance:0.698～7.8710m ☞ ☞

(ERRATUM)
Manualfocus mode:
(CORRECT)
Manual focus mode: ☞
(ERRATUM)
Program control abuve 1/200sec (EV10.6)
(CORRECT)
Program control above 1/200sec (EV10.6) ☞

Page A-6
(ERRATUM)
In mannual focusing mode, set the focus dial so that the in-focus mark light up.
(CORRECT)
In manual focusing mode, set the focus dial so that the in-focus mark light up. ☞

Page A-8
(CORRECT)



Page A-11
(ERRATUM)
With the stop of turning, the pulse emission chauges to the emission of every 1/2 second and turns 8 seconds later.
(CORRECT)
With the stop of turning, the pulse emission changes to the emission of every 1/2 second and turns 8 seconds later.

(ERRATUM)
"Near focus" or "far focus" is determinrd by the receiver of the SPD.
(CORRECT)
"Near focus" or "far focus" is determined by the receiver of the SPD.

(ERRATUM)
Flash control signal and charge voltage completion difecting line.
(CORRECT)
Flash control signal and charge voltage completion detecting line.

Page A-24
(ERRATUM)

| | | | |
|---|---|---|---|
| 4 | CONT | INT4 CONt | |

(CORRECT)

| | | | |
|---|---|---|---|
| 4 | CONT | INT4 CONT | |

Page A-28
(ERRATUM)
This is a power ON start imput that rises irrespectire of the start of the main switch (ON or OFF).
(CORRECT)
This is a power ON start imput that rises irrespective of the start of the main switch (ON or OFF).

Page A-28
(ERRATUM)
(3) On-demand Rewind Switch (P70)
(CORRECT)
(3) On-demand Rewind Switch (KR4)

(ERRATUM)
(4) Test Switch (P71)
(COLLECT)
(4) Test Switch (KR5)

(ERRATUM)
(5) SY (Check) Switch (P73)
(CORRECT)
(5) SY (Check) Switch (KR7)

(ERRATUM)
During this time, light metering only is displayed repeetedly if the focus dial is in the AF position.
(CORRECT)
During this time, light metering only is displayed repeatedly if the focus dial is in the AF position.

Page A-28
(ERRATUM)
(6) S2 (Release) Switch (P72)
(CORRECT)
(6) S2 (Release) Switch (KR6)

Page A-35
(ERRATUM)
AT 2.3V (equivalent to 300V), IC101 turns OFF the CHG signal.
(CORRECT)
At 2.3V (equivalent to 300V), IC101 turns OFF the CHG Signal.

Page A-39
(ERRATUM)
From OFF position, the motor is run forward (advance) unitil ON of CODE2.
(CORRECT)
From OFF position, the motor is run forward (advance) until ON of CODE 2.

Page A-41
(ERRATUM)
Control processings are carried out according to the data stoved on the RAM.
(CORRECT)
Control processings are carried out according to the data stored on the RAM.

(ERRATUM)
⑰ A/D compensation value of foucus dial (OFF-AF, AF-∞, ∞-16)
(CORRECT)
⑰ A/D compensation value of focus dial (OFF-AF, AF-∞, ∞-16)

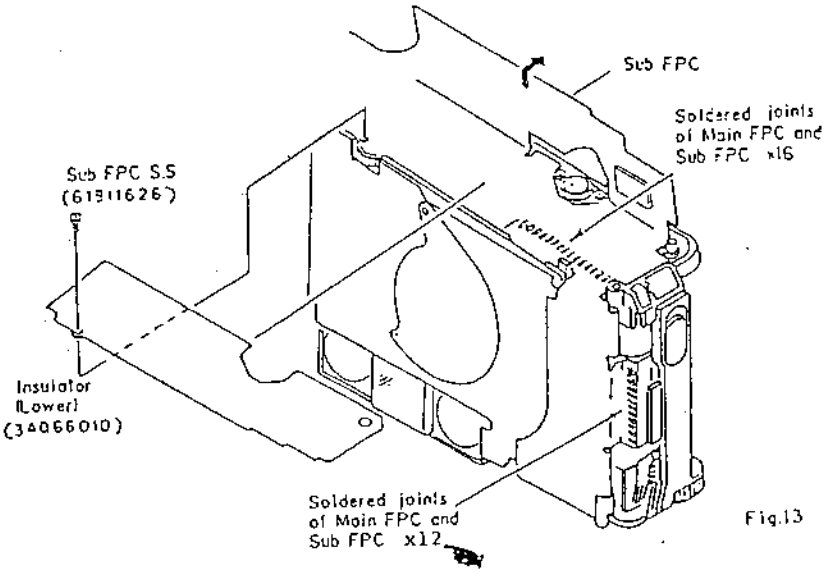
Page B-1
(ERRATUM)
5) With the Botton Cover removed, the RW Botton Holder (3AQ650), RW Botton (3AQ651) and spacer (3AQ128) win come off.
(CORRECT)
5) With the Bottom Cover removed, the RW Button Holder (3AQ650), RW Button (3AQ651) and Spacer (3AQ128) will come off.

Page B-2
(ERRATUM)
Notes: a) The spacer is gulued to the Battery Cap Holder (3AQ126).
(CORRECT)
Notes: a) The spacer is glued to the Battery Cap Holder (3AQ126).

Page B-5
(ERRATUM)
remember that the Hinge Holder Plate Base Plate Base and the camera body are sealed in two positions.
(CORRECT)
remember that the Hinge Holder Plate Base and the camera body are sealed in two positions.

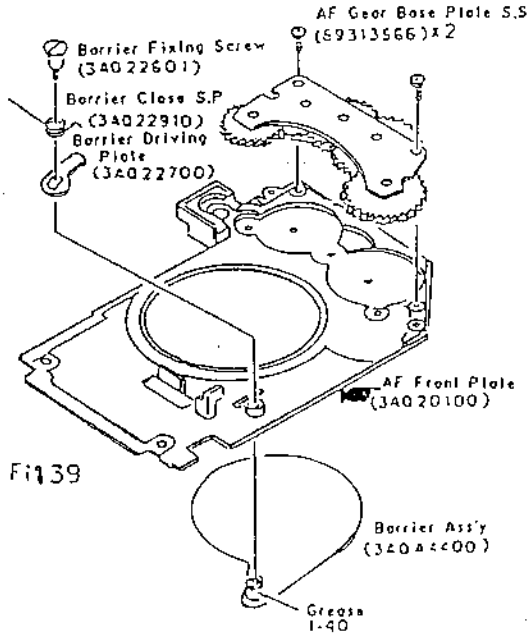
Page B-9
(ERRATUM)
12) Take off the Sub FPC in the divection of the arrow.
(CORRECT)
12) Take off the Sub FPC in the direction of the arrow.

Page B-9
(CORRECT)


Sub FPC
Soldered joints of Main FPC and Sub FPC x16
Sub FPC S.S (61911626)
Insulator (Lower) (3A066010)
Soldered joints of Main FPC and Sub FPC x12
Fig.13

Page B-16
(ERRATUM)
Note: Take cave not to damage the MM Gear (1) (3AQ 60200).
(CORRECT)
Note: Take care not to damage the MM Gear (1) (3AQ 60200).

Page C-1
(CORRECT)


AF Gear Base Plate S.S (S9313566) x2
Barrier Fixing Screw (3A022601)
Barrier Close S.P (3A022910)
Barrier Driving Plate (3A022700)
AF Front Plate (3A020100)
Barrier Ass'y (3A0A2200)
Grease 1-40
Fig.39

Page C-3
(ERRATUM)
The value entered is a decimal frection only as shown below.
(CORRECT)
The value entered is a decimal fraction only as shown below.

Page C-4
(ERRATUM)
3) Secure the F.B Adjusting Washers by tightering.
(CORRECT)
3) Secure the F.B Adjusting washers by tightening.

Page C-4

(ERRATUM)

| Washer | |
|---|---|
| Thickhess | Part No. |
| | |

(CORRECT)

| Washer | |
|---|---|
| Thickness | Part No. |
| | |

Page C-5

(ERRATUM)

6) Pass the Orange, Black, Green and Gray Lead Wires from the Diaphram P.C Board.

(CORRECT)

6) Pass the Orange, Black, Green and Gray Lead Wiers from the Diaphragm P.C Board.

(ERRATUM)

Notes: a) Cleen Diaphragm Contact with ether alcohol.

(CORRECT)

Notes: a) Clean Diaphragm COntact with ehter alcohol.

(ERRATUM)

10) Solder the Yellow and Pueple Lead Wires from the SPD Board.

(CORRECT)

10) Solder the Yellow and Purple Lead Wires from the SPD Board.

Page C-6

(ERRATUM)

C) There are two kinds of sutter FPC,

(CRRECT)

C) There are two kinds of shutter FPC,

(ERRATUM)

to the Sutter FPC from below.

(CRRECT)

to the Shutter FPC from below.

Page C-7

(ERRATUM)

Notes: a) Do not semear or leave fingerprints on the cam FPC Pattern.

(CRRECT)

Notes: a) Do not make dirt or leave fingerprints on the Cam FPC Pattern

(ERRATUM)

b) AFter tightering the Lens Cell Cam Shaft,

(CRRECT)

b) After tightening the Lens Cell Cam Shaft,

Page C-11

(ERRATUM)

Note: a) Where the lens abvanced irregularly,

(CORRECT)

Note: a) Where the lens advanced irregularly,

Page C-12

(ERRATUM)

1) Fit the Lock Plate Cover (3AQ 11010) on the Release Kuob (3AQ 11700).

(CORRECT)

1) Fit the Lock Plate Cover (3AQ11010) on the Release Knob (3AQ11700).

Page C-14
(ERRATUM)
1) and secure them by tightering the Rewind Fork Setscrew (66001042)
(CORRECT)
1) and secure them by tightening the Rewind Fork Setscrew (66001042).

Page C-19
(ERRATUM)
1) Stick the doule stick tape for forming the Cam FPC as follows:
(CORRECT)
1) Stick the double stick tape for forming the Cam FPC as follows:

(ERRATUM)
3) Check to make sure that the AL Roler turn smoothly.
(CORRECT)
3) Check to make sure that the AL Roller turn smoothly.

Page C-36
(ERRATUM)
Red Lead Wire along Battery ohamber, keeping it away from Rewind SW Pattern.
(CORRECT)
Red Lead Wire along Battery chamber, keeping it away from Rewind SW Pattern.

Page C-38
(ERRATUM)
VR-VS=360 5mv (Ta=25°C)
(CORRECT)
VR-VS=360 ±5mv (Ta=25°C)

Page C-40
(ERRATUM)
and turn the leel at the Test Contact to "L".
(CORRECT)
and turn the Tool at the Test Contact to "L".

Page C-41
(ERRATUM)
Adress change:
(CORRECT)
Address change:

Page C-42
(ERRATUM)

| | | | |
|---|---|---|---|
| ⑥ | | | Date of address "$20" is "$00" |

(CORRECT)

| | | | |
|---|---|---|---|
| ⑥ | | | Date of address "$B0" is "$00" |

Page C-43
(ERRATUM)
Before atarting and chutter delay (address $22) to
(CORRECT)
Before starting and Shutter delay (address $22) to

Page C-43
(ERRATUM)
becomes within 0.3EV
(CORRECT)
becomes within ±0.3EV

Page C-44
(CORRECT)

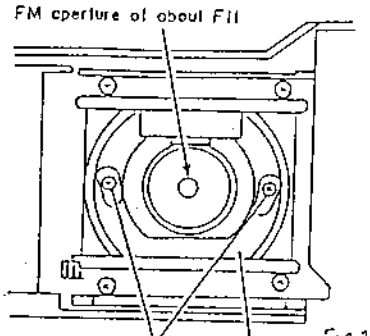


Fig 122

Page C-46
(ERRATUM)
Adress
S32------
S34------
S36------
S38------

(CORRECT)
Address
$32------
$34------
$36------
$38------

Page C-49
(ERRATUM)
S90------
S92------
S94------
(CORRECT)
$90------
$92------
$94------

Page C-51
(ERRATUM)

| NAME | Ad-dress | Basic Design | |
|---|---|---|---|
| ≈ | ≈ | ≈ | ≈ |
| EXPDT1 | $5C | $0A | |
| EXPDT2 | $5C | $F6 | |
| | | | |

(CORRECT)

| NAME | Ad-dress | Basic Design Value | |
|---|---|---|---|
| ≈ | ≈ | ≈ | ≈ |
| EXPDT1 | $5C | $0A | |
| EXPDT2 | $5E | $F6 | |
| | | | |

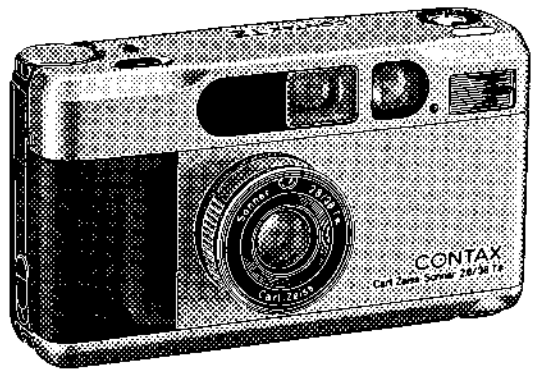
Page C-54
(ERRATUM)
OReract barrel operation
(CRRECT)
ORetract barrel operation

Page C-68
(ERRATUM)
Electric Parts of New Sub FPC Ass'y
(CRRECT)
Electric Parts of Old Sub FPC Ass'y

Page C-69
(ERRATUM)
Electric Parts of Old sub FPC Ass'y
(CRRECT)
Electric Parts of New Sub FPC Ass'y

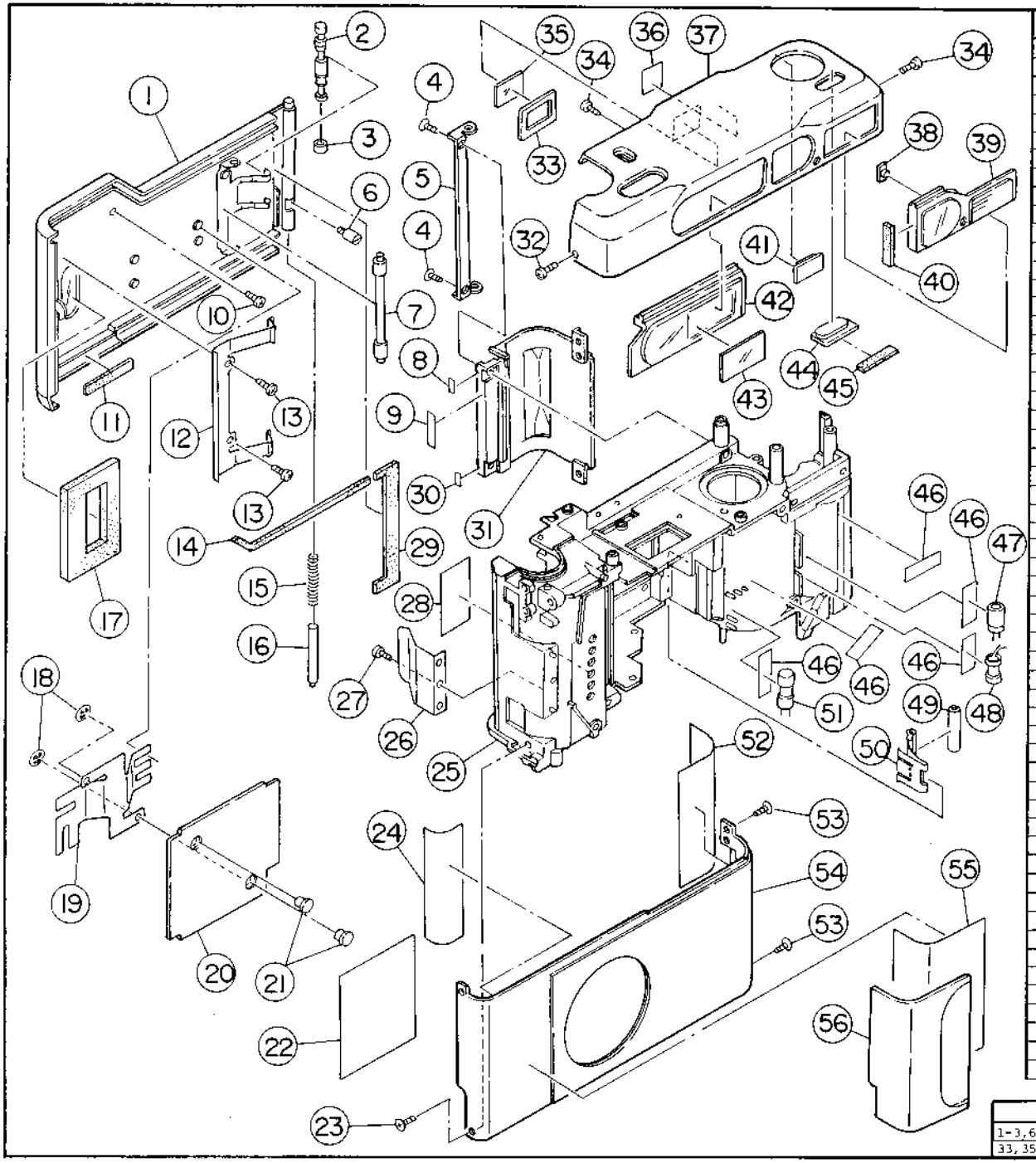
# CONTAX T2

## ASSEMBLING CHART




KYOCERA CORPORATION
Optical Equipments Division

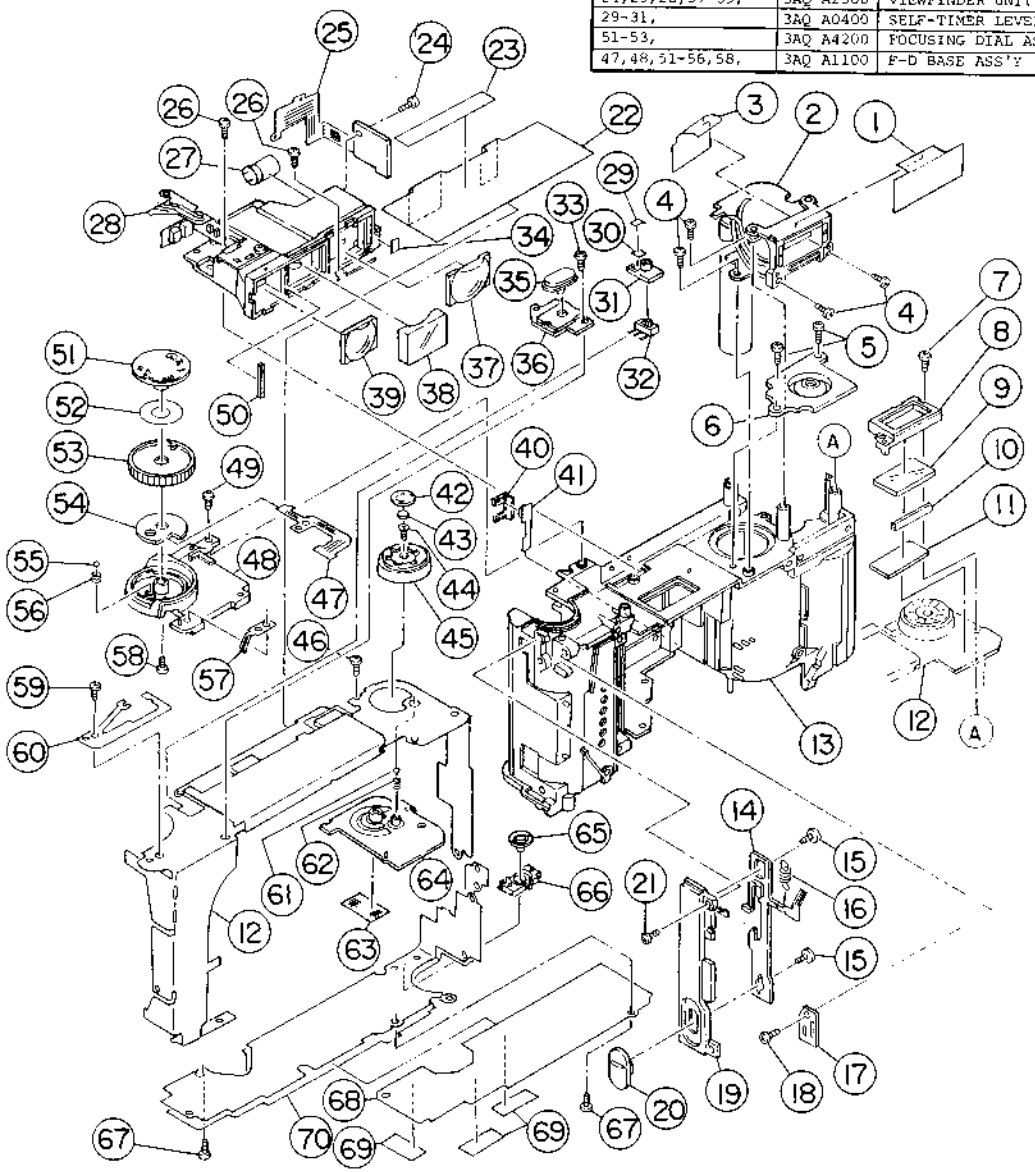
SERVICE 910320



| | PARTS NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 1 | * | BACK COVER | 1 |
| 2 | 396 32610 | GUIDE ROLLER | 1 |
| 3 | 174 44301 | ROLLER TUBE | 1 |
| 4 | 69314522 | HINGE HOLDER PLATE S.S | 2 |
| 5 | 3AQ 14802 | HINGE HOLDER PLATE | 1 |
| 6 | 3AQ 16800 | HINGE SHAFT STOPPER | 1 |
| 7 | 3AQ 17301 | FILM PRESSURE ROLLER | 1 |
| 8 | 3AQ 18200 | HINGE LIGHT-PROOF CLOTH(2) | 1 |
| 9 | 3AQ 14110 | FILM MARK | 1 |
| 10 | 69113076 | BAVK COVER GRIP S.S | 1 |
| 11 | 3AQ 17000 | GRIP MOQUETTE | 1 |
| 12 | 3AQ 15600 | CARTRDGE PRESSURE PLATE | 1 |
| 13 | 69111682 | CARTRIDGE PRESSURE PLATE S.S | 2 |
| 14 | 3AQ 16910 | BACK COVER MOQUETTE | 1 |
| 15 | 174 17700 | HINGE SHAFT SPRING | 1 |
| 16 | 3AQ 16501 | HINGE SHAFT(1) | 1 |
| 17 | 174 17200 | BACK COVER WINDOW MOQUETTE | 1 |
| 18 | 66161524 | CS CIR-CLIP | 2 |
| 19 | 3AQ 16110 | PRESSUIE PLATE SPRING | 1 |
| 20 | 3AQ 16003 | PRESSURE PLATE | 1 |
| 21 | 3AQ 16301 | PRESUURE PLATE SHAFT | 2 |
| 22 | 3AQ 14200 | PRESUURE PLATE SHEET | 1 |
| 23 | 69314076 | FRONT COVER S.S | 1 |
| 24 | 3AQ 81500 | INSULATOR(LEFT) | 1 |
| 25 | * | BODY | 1 |
| 26 | 378 11500 | CARTRIDGE HOLDER | 1 |
| 27 | 69111682 | CARTRIDGE HOLDER S.S | 1 |
| 28 | 378 10700 | EXPLANATION SEAL | 1 |
| 29 | 3AQ 16701 | HINGE MOQUETTE | 1 |
| 30 | 3AQ 18101 | HINGE LIGHT-PROOF CLOTH(1) | 1 |
| 31 | 3AQ 14903 | HINGE HOLDER PLATE BASE | 1 |
| 32 | 69115572 | TOP COVER S.S | 1 |
| 33 | 3AQ 82302 | F. EYE-PIECE GLASS HOLDER | 1 |
| 34 | 69113572 | TOP COVER S.S | 2 |
| 35 | 3AQ 82100 | F. EYE-PIECE GLASS | 1 |
| 36 | 3AQ 81600 | INSULATOR(REAR) | 1 |
| 37 | * | TOP COVER | 1 |
| 38 | 3AQ 34002 | ST-LED WINDOW | 1 |
| 39 | 3AQ 85210 | AF PROJECTION WINDOW | 1 |
| 40 | 3AQ 85600 | AF WINDOW MOQUETTE(2) | 1 |
| 41 | 3AQ 32700 | EXP. COMPENSATION WINDOW | 1 |
| 42 | 3AQ 85320 | AF REFLECTED LIGHT WINDOW | 1 |
| 43 | 3AQ 82200 | F. OBJECTIVE GLASS | 1 |
| 44 | 3AQ 33400 | COUNTER WINDOW | 1 |
| 45 | 3AQ 85504 | AF WINDOW MOQUETTE | 1 |
| 46 | * | DOUBLE STICK TAPE | 5 |
| 47 | SECEROJ10156*01 | ELECTROLYTIC CAPACITOR | 1 |
| 48 | SELBR5522700101 | COIL | 1 |
| 49 | 396 62500 | AL ROLLER | 1 |
| 50 | 396 62600 | AL ROLLER HOLDER | 1 |
| 51 | SECEROJ47156*01 | ELECTROLYTIC CAPACITOR | 1 |
| 52 | 3AQ 81301 | INSULATOR(RIGHT) | 1 |
| 53 | 69313576 | FRONT COVER S.S | 2 |
| 54 | 3AQ 35011 | FRONT COVER | 1 |
| 55 | 3AQ 35401 | FRONT GRIP TAPE | 1 |
| 56 | 3AQ 35300 | FRONT GRIP | 1 |

| | PARTS NO. | DESCRIPTION |
|---|---|---|
| 1-3,6,7,10-21,29, | 3AQ A0200 | BACK COVER (N) ASS'Y |
| 33,35-45, | 3AQ A0300 | TOP COVER ASS'Y |

NOTE: Parts with marked * are not available.



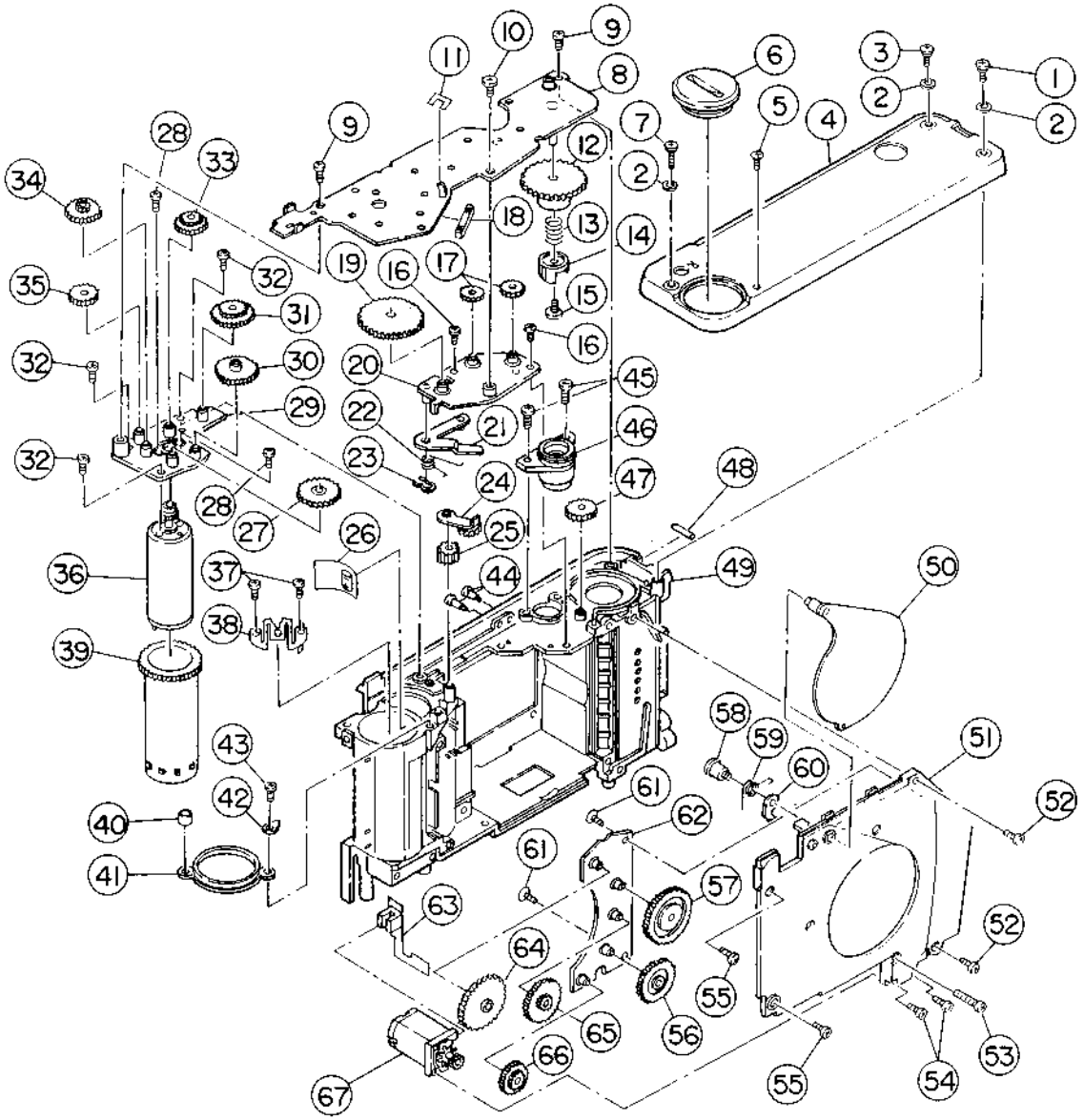
| | PARTS NO. | DESCRIPTION |
|---|---|---|
| 12,44,45,61-64, | 3AQ A0600 | MAIN FPC ASS'Y |
| 24,25,28,37-39, | 3AQ A2300 | VIEWFINDER UNIT ASS'Y |
| 29-31, | 3AQ A0400 | SELF-TIMER LEVER ASS'Y |
| 51-53, | 3AQ A4200 | FOCUSING DIAL ASS'Y |
| 47,48,51-56,58, | 3AQ A1100 | F-D BASE ASS'Y |

| | PARTS NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 1 | 3AQ 53810 | FLASH SHEET | 1 |
| 2 | 3AQ 53500 | FLASH UNIT | 1 |
| 3 | 3AQ 53600 | FLASH INSULATION SHEET | 1 |
| 4 | 69114076 | FLASH UNIT S.S | 4 |
| 5 | 69113076 | SPOOL HOLDER S.S | 2 |
| 6 | 3AQ 60901 | SPOOL HOLDER | 2 |
| 7 | 69217066 | LCD RETAINER S.S | 1 |
| 8 | 3AQ 33510 | LCD RETAINER | 1 |
| 9 | 3AQ 53100 | C-LCD | 1 |
| 10 | 3AQ 53202 | LCD CONNECTOR | 1 |
| 11 | 3AQ 33600 | LCD SPACER | 1 |
| 12 | * | MAIN FPC | 1 |
| 13 | * | BODY | 1 |
| 14 | 3AQ A5400 | LOCK PLATE ASS'Y | 1 |
| 15 | 66001142 | LOCK PLATE ASS'Y S.S | 2 |
| 16 | 3AQ 11401 | LOCK PLATE SPRING | 1 |
| 17 | 3AQ 52311 | LOCK SWITCH BOARD | 1 |
| 18 | 69213076 | LOCK SWITCH BOARD S.S | 1 |
| 19 | 3AQ 11010 | LOCK PLATE COVER | 1 |
| 20 | 3AQ 11700 | RELEASE KNOB | 1 |
| 21 | 69113576 | LOCK PLATE COVER S.S | 1 |
| 22 | 3AQ 81201 | INSULATOR(UPPER) | 1 |
| 23 | * | DOUBLE STICK TAPE | 1 |
| 24 | 691215066 | VIEWFINDER LED S.S | 1 |
| 25 | 3AQ 53001 | VIEWFINDER LED | 1 |
| 26 | 69212586 | VIEWFINDER UNIT ASS'Y S.S | 2 |
| 27 | 5ECE0J10256*01 | ELECTROLYTIC CAPACITOR | 1 |
| 28 | * | VIEWFINDER UNIT | 1 |
| 29 | 3AQ 31602 | SELF-TIMER NAME PLATE | 1 |
| 30 | 3AQ 31700 | SELF-TIMER TAPE | 1 |
| 31 | 3AQ 31200 | SELF-TIMER LEVER | 1 |
| 32 | 3AQ 54200 | SELF-TIMER SWITCH | 1 |
| 33 | 69114076 | RELEASE SWITCH S.S | 1 |
| 34 | 1AA 66500 | PHOTOMETRY COVER ADHESIVE TAPE | 1 |
| 35 | 3AQ 31400 | RELEASE BUTTON | 1 |
| 36 | 3AQ A6400 | RELEASE SWITCH ASS'Y | 1 |
| 37 | 3AQ 85000 | AF PROJECTION WINDOW | 1 |
| 38 | 3AQ 80400 | F. OBJECTIVE LENS | 1 |
| 39 | 3AQ 85100 | AF REFLECTED LIGHT LENS | 1 |
| 40 | 3AQ 65200 | PI. WI HOLDER | 1 |
| 41 | 3AQ A2000 | PI. WI ASS'Y | 1 |
| 42 | 3AQ 32303 | EXP. COMPENSATION DECORATING PLATE | 1 |
| 43 | 3AQ 32920 | EXP. COMPENSATION DIAL PACKING | 1 |
| 44 | 66001147 | EXP. COMPENSATION DIAL S.S | 1 |
| 45 | 3AQ A3900 | EXP. COMPENSATION DIAL ASS'Y | 1 |
| 46 | 69213576 | MAIN FPC S.S | 1 |
| 47 | 3AQ 50601 | OPERATION FPC | 1 |
| 48 | 3AQ 30210 | F-D BASE | 1 |
| 49 | 69213076 | F-D BASE S.S | 1 |
| 50 | 3AQ 86000 | AF WINDOW MOQUETTE(3) | 1 |
| 51 | 3AQ 30403 | F-D INDICATE PLATE | 1 |
| 52 | 3AQ 30700 | F-D TAPE | 1 |
| 53 | * | FOCUSING DIAL | 1 |
| 54 | 3AQ 52101 | F-D P.C BOARD | 1 |
| 55 | 66701220 | STEEL BALL(ø1.2) | 1 |
| 56 | 3AQ 30800 | F-D CLICK SPRING | 1 |
| 57 | 3AQ 31101 | F-D BASE CONTACT | 1 |
| 58 | 66001141 | FOCUSING DIAL S.S | 1 |
| 59 | 69216076 | RELEASE PLATE SPRING S.S | 1 |
| 60 | 3AQ 31510 | RELEASE PLATE SPRING | 1 |

| | PARTS NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 66 | 3AQ 65010 | RW BUTTON HOLDER | 1 |
| 67 | 61911626 | SUB FPC S.S | 2 |
| 68 | 3AQ 66010 | INSULATOR(LOWER) | 1 |
| 69 | * | DOUBLE STICK TAPE | 3 |
| 70 | 3AQ A0700 | SUB FPC ASS'Y | 1 |

| | PARTS NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 61 | 66701220 | STEEL BALL(ø1.2) | 1 |
| 62 | 3AQ 30601 | CLICK SPRING | 1 |
| 63 | * | ACETATE CLOTH TAPE | 1 |
| 64 | 3AQ A4000 | EXP. COMPENSATION P.C BOARD ASS'Y | 1 |
| 65 | 3AQ 65100 | RW BUTTON | 1 |

NOTE: Parts with marked * are not available.

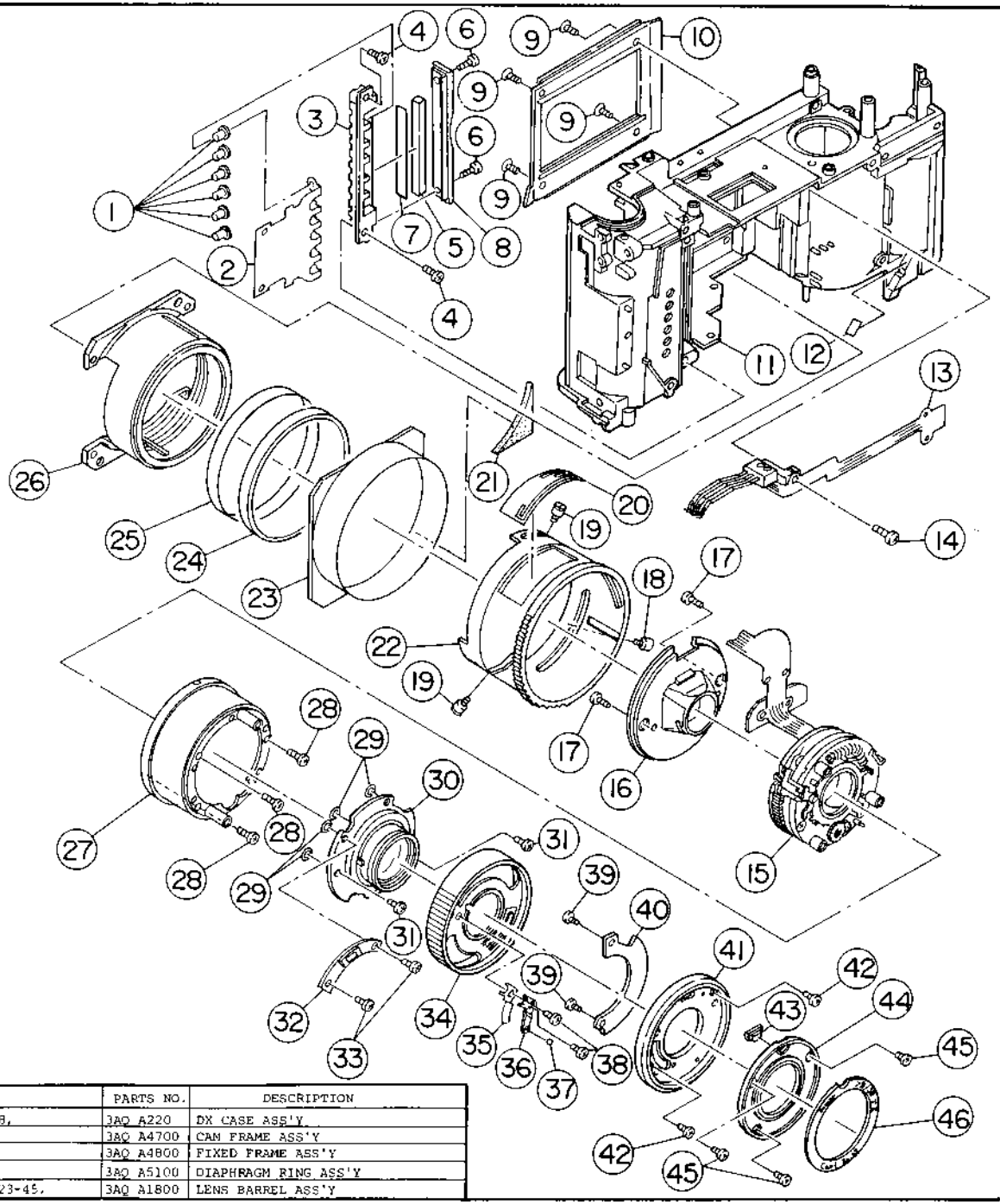


| | PARTS NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 1 | 66001143 | BOTTOM COVER S.S | 1 |
| 2 | 3AQ 36210 | BOTTOM COVER PACKING | 3 |
| 3 | 66001144 | BOTTOM COVER S.S | 1 |
| 4 | 3AQ 36003 | BOTTOM COVER | 1 |
| 5 | 69314062 | BOTTOM COVER S.S | 1 |
| 6 | 3AQ 12501 | BATTERY CAP | 1 |
| 7 | 66001145 | BOTTOM COVER S.S | 1 |
| 8 | * | MM BASE PLATE(LOWER) | 1 |
| 9 | 69113076 | MM BASE PLATE(LOWER) S.S | 2 |
| 10 | 66001023 | MM BASE PLATE(LOWER) S.S | 1 |
| 11 | 3AQ 69000 | MM LIGHT-PROOF CLOTH | 1 |
| 12 | 3AQ 63001 | REWIND GEAR | 1 |
| 13 | 3AQ 69100 | REWIND FORK SPRING | 1 |
| 14 | 378 62701 | REWIND FORK | 1 |
| 15 | 66001042 | REWIND FORK S.S | 1 |
| 16 | 69112566 | MM BASE PLATE(UPPER) S.S | 2 |
| 17 | 3AQ 62201 | MM GEAR(8) | 2 |
| 18 | * | ACETATE CLOTH TAPE | 1 |
| 19 | 3AQ 62101 | MM GEAR(7) | 1 |
| 20 | * | MM BASE PLATE(UPPER) | 1 |
| 21 | 3AQ A4600 | BARRIER LEVER ASS'Y | 1 |
| 22 | 3AQ 23000 | BARRIER SPRING | 1 |
| 23 | 66172025 | GS RING | 1 |
| 24 | 3AQ A1300 | EPICYCLIC GEAR ASS'Y | 1 |
| 25 | 3AQ 60701 | MM SUN GEAR | 1 |
| 26 | 3AQ 12300 | BATTERY COMPARTMENT SEL | 1 |
| 27 | 3AQ 60510 | MM GEAR(4) | 1 |
| 28 | 61913526 | WINDING MOTOR S.S | 2 |
| 29 | 3AQ 60010 | MM MOTOR HOLDER | 1 |
| 30 | 3AQ 60610 | MM GEAR(5) | 1 |
| 31 | 3AQ 62010 | MM GEAR(6) | 1 |
| 32 | 69113576 | MM MOTOR ASS'Y S.S | 3 |
| 33 | 3AQ 60220 | MM GEAR(1) | 1 |
| 34 | 3AQ 60420 | MM GEAR(3) | 1 |
| 35 | 3AQ 60320 | MM GEAR(2) | 1 |
| 36 | * | WINDING MOTOR | 1 |
| 37 | 69113576 | BATTERY CONTACT S.S | 2 |
| 38 | 3AQ 12700 | BATTERY CONTACT(PLUS) | 1 |
| 39 | 396 61010 | SPOOL GEAR | 1 |
| 40 | 3AQ 12800 | SPACER | 1 |
| 41 | 3AQ 12600 | BATTERY CAP HOLDER | 1 |
| 42 | 3AQ 12900 | MINUS LUG PLATE | 1 |
| 43 | 69114072 | BATTERY CAP HOLDER S.S | 1 |
| 44 | 3AQ 12210 | DB CONTACT | 2 |
| 45 | 69224566 | TRIPOD HOLDER S.S | 2 |
| 46 | 3AQ 14503 | TRIPOD HOLDER | 1 |
| 47 | 3AQ 62303 | MM GEAR(9) | 1 |
| 48 | 66670130 | PARALLEL PIN | 1 |
| 49 | * | BODY | 1 |
| 50 | 3AQ A4400 | BARRIER ASS'Y | 1 |
| 51 | 3AQ 20104 | AF FRONT PLATE | 1 |
| 52 | 69114076 | AF FRONT PLATE S.S | 2 |
| 53 | 69117066 | AF MOTOR ASS'Y S.S | 1 |
| 54 | 69115066 | AF MOTOR ASS'Y S.S | 2 |
| 55 | 69112566 | AF FRONT PLATE S.S | 2 |
| 56 | 3AQ 20501 | AF GEAR(2) | 1 |
| 57 | 3AQ 20701 | AF GEAR(4) | 1 |
| 58 | 3AQ 22601 | BARRIER FIXED SCREW | 1 |
| 59 | 3AQ 22910 | BARRIER CLOSE SPRING | 1 |
| 60 | 3AQ 22700 | BARRIER DRIVING PLATE | 1 |

| | PARTS NO. | DESCRIPTION |
|---|---|---|
| 8,12-15, | 3AQ A1200 | MM BASE PLATE(LOWER) ASS'Y |
| 20-23, | 3AQ A1600 | MM BASE PLATE(UPPER) ASS'Y |
| 28,29,36, | 3AQ A1500 | MM MOTOR ASS'Y |
| 50,51,53,54,56-67, | 3AQ A1400 | AF FRONT PLATE ASS'Y |

| | PARTS NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 61 | 69313566 | AF GEAR BASE PLATE S.S | 2 |
| 62 | 3AQ A2100 | AF GEAR BASE PLATE ASS'Y | 1 |
| 63 | 3AQ A4300 | PI. AF ASS'Y | 1 |
| 64 | 3AQ 20801 | AF GEAR(5) | 1 |
| 65 | 3AQ 20601 | AF GEAR(3) | 1 |
| 66 | 3AQ 20402 | AF GEAR(1) | 1 |
| 67 | 3AQ A4500 | AF MOTOR ASS'Y | 1 |

NOTE: Parts with marked * are not available.



| | PARTS NO. | DESCRIPTION |
|---|---|---|
| 1-3,5-8, | 3AQ A220 | DX CASE ASS'Y |
| 20,22, | 3AQ A4700 | CAM FRAME ASS'Y |
| 24-26, | 3AQ A4800 | FIXED FRAME ASS'Y |
| 34-38, | 3AQ A5100 | DIAPHRAGM RING ASS'Y |
| 15-20,23-45, | 3AQ A1800 | LENS BARREL ASS'Y |

| | PARTS NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 1 | 174 46211 | DX PIN | 6 |
| 2 | 3AQ 50400 | DX FPC | 1 |
| 3 | 3AQ 13003 | DX CASE | 1 |
| 4 | 69113076 | DX CASE S.S | 2 |
| 5 | 174 46300 | DX RUBBER | 1 |
| 6 | 69113076 | DX FIXER S.S | 2 |
| 7 | 1AA 68900 | DX PIN SPACER | 1 |
| 8 | 3AQ 13402 | DX FIXER | 1 |
| 9 | 61812528 | APERTURE S.S | 4 |
| 10 | 3AQ 14003 | APERTURE | 1 |
| 11 | * | BODY | 1 |
| 12 | 3AQ 19000 | BARRIER CUSHION | 1 |
| 13 | 3AQ A1700 | CAM SWITCH ASS'Y | 1 |
| 14 | 69214576 | CAM SWITCH ASS'Y S.S | 1 |
| 15 | 3AQ 25701 | SHUTTER | 1 |
| 16 | 3AQ 25802 | SHUTTER LIGHT-PROOF FRAME | 1 |
| 17 | 61902229 | SHUTTER LIGHT-PROOF FRAME S.S | 2 |
| 18 | 3AQ 25303 | LENS CELL CAM SHAFT | 1 |
| #19 | 3AQ 25610 | CAM SCREW(2) | 2 |
| #19 | 3AQ 26210 | CAM SCREW(4) | 2 |
| #19 | 3AQ 26800 | CAM SCREW(5) | 2 |
| 20 | 3AQ 51102 | CAM FPC | 1 |
| 21 | 3AQ 18000 | LIGHT-PROOF FRAME MOQUETTE | 1 |
| 22 | 3AQ 25203 | CAM FRAME | 1 |
| 23 | 3AQ 26001 | LENS BARREL LIGHT-PROOF FRAME | 1 |
| 24 | 3AQ 26540 | LENS CELL MOQUETTE | 1 |
| #25 | 3AQ 26830 | FIXED FRAME AUXILIARY SHEET | 1 |
| 26 | 3AQ 25130 | FIXED FRAME | 1 |
| 27 | 3AQ A5300 | LENS CELL BASE ASS'Y | 1 |
| 28 | 63903326 | SHUTTER S.S | 3 |
| #29 | 60121510 | FLANGE BACK ADJUSTMENT WASHER(t:0.2) | 4 |
| #29 | 60131510 | FLANGE BACK ADJUSTMENT WASHER(t:0.3) | 4 |
| #29 | 60141510 | FLANGE BACK ADJUSTMENT WASHER(t:0.4) | 4 |
| #29 | 60151510 | FLANGE BACK ADJUSTMENT WASHER(t:0.5) | 4 |
| #29 | 60161510 | FLANGE BACK ADJUSTMENT WASHER(t:0.6) | 4 |
| #29 | 60171510 | FLANGE BACK ADJUSTMENT WASHER(t:0.7) | 4 |
| #29 | 60181510 | FLANGE BACK ADJUSTMENT WASHER(t:0.8) | 4 |
| 30 | 3AQ 26300 | LENS UNIT | 1 |
| #31 | 61902229 | LENS UNIT S.S | 2 |
| #31 | 61902522 | LENS UNIT S.S | 2 |
| #31 | 61902826 | LENS UNIT S.S | 2 |
| 32 | 3AQ 52802 | SPD P.C BOARD | 1 |
| #33 | 63902529 | SPD P.C BOARD S.S | 2 |
| #33 | 63903022 | SPD P.C BOARD S.S | 2 |
| #33 | 63903326 | SPD P.C BOARD S.S | 2 |
| 34 | * | DIAPHRAGM RING | 1 |
| 35 | 3AQ 27502 | DIAPHRAGM CLICK SPRING | 1 |
| 36 | 3AQ 27402 | DIAPHRAGM CLICK HOLDER | 1 |
| 37 | 66701220 | STEEL BALL(ø1.2) | 1 |
| 38 | 61901426 | DIAPHRAGM CLICK HOLDER S.S | 2 |
| 39 | 61901622 | DIAPHRAGM P.C BOARD S.S | 2 |
| 40 | 3AQ 52010 | DIAPHRAGM P.C BOARD | 1 |
| 41 | 3AQ 27820 | LENS CELL FRONT RING | 1 |
| 42 | 66001011 | LENS CELL FRONT RING S.S | 2 |
| 43 | 3AQ 28102 | LIGHT GATHERING LENS | 1 |
| 44 | 3AQ 28002 | LENS CELL DECORATING PLATE | 1 |
| 45 | 61901426 | LENS CELL DECORATING PLATE S.S | 3 |
| 46 | 3AQ 28302 | LENS CELL NAME PLATE | 1 |

NOTE: Parts with marked * are not available.
In case of the Parts with # mark in the list, please select and use them carefully.